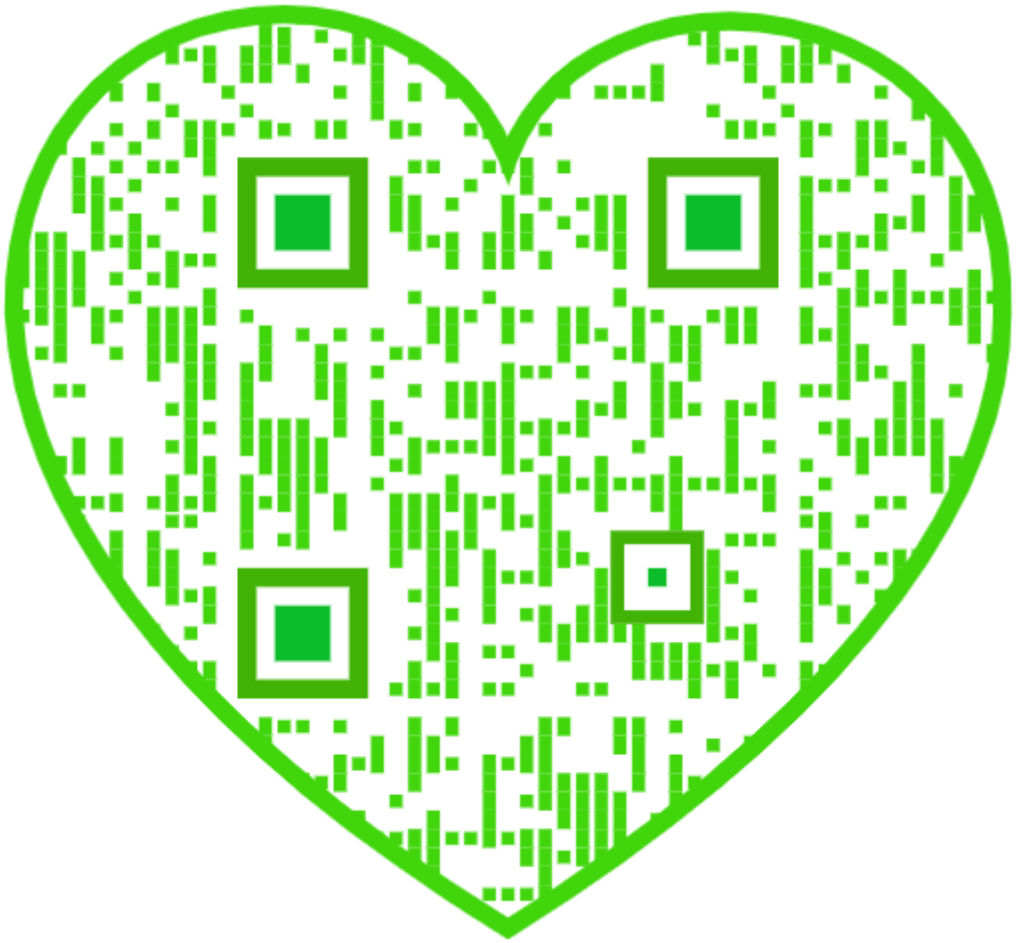

INDIAN BASKETRY

Plate 6. See page 33

KLAMATH INDIAN GAMBLING TRAY

In overlaid twined weaving, showing lines and squares dyed in Eversia

A sak-lotks' p'a'-hla or flexible gambling tray of the Klamath Indians of Oregon. Both warp (pa-chls') and weft (twach) are of cords of undyed twisted tule (p. 38), which are fully exposed only in the pale-brown stripe at the margin, where the ends of the warp are interlaced and bound with a strengthening cord of gray fiber from the nettle (p. 40). Every other stitch of the tray is covered with an overlaying material: the white is of reed (p. 33); the black (mok'-was) is of tule dyed in mud springs containing iron; the canary yellow is of porcupine quills (smai'-am) dyed with wolf moss (p. 28), and the brown of the ring near the center of the tray is of undyed tule. Nettle cord was used in binding the strands of warp together at the beginning.

The main trefoil pattern is of unknown significance. The triangles upon it are bird-wing patterns (slas-al'-tls), while the triangles on the marginal design are arrow-head patterns (sa'-wal-sal'tls). The brown and black ring near the center is an op'-k'a, a name applied only to a ring of transversely alternating colours. A ring of uniform colour would be a smêl-ô'-g'a.

Collection of Frederick V. Coville

Indian Basketry

Studies in a Textile Art Without Machinery

By Otis Tufton Mason

Curator, Division of Ethnology, U. S. National Museum

VOLUME I

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INTRODUCTION

Adde et *bascuada* et mille escaria.
TERENCE, 12:46.
Barbara de pictis veni *bascuada* Britannis
Sed me jam mavult dicere Roma suum.
MARTIAL, XIV:99.

ABORIGINAL British or Pictish baskets and a thousand receptacles, says Terence, were carried to Rome by the successors of Julius Cæsar, and Martial adds that the word "basket" is Pictish,* though the Romans would have us believe it to have been indigenous.

Remnants of basketry are gathered from the Swiss lake-dwellings, made in several of the technical processes well known to the American Indians and to be described later.

In the second volume of Keller's Lake Dwellings (pls. 134–137) are startlingly interesting groups of such basketry. You have, first of all, the methods of treating the bark of trees and flax to form the fiber in various stages of preparation. Network and frame weaving are also there illustrated, but in this place attention is drawn only to the basketry. On his Plate 134 may be seen plain checkerwork and twined work in 2-strand and 3-strand varieties, also coiled work in the following varieties: (*a*) Foundation of two rods, sewing done with bark strips, so as to inclose both rods below, the stitches interlocking; (*b*) foundation of two rods, sewing inclosing them both, but only one of the rods underneath; the stitches interlock and split the upper portion of the one just below, as in many American baskets. The twined work of Robenhausen and Wangen is in a great number of varieties. There is solid, plain weaving; also openwork twined weaving, the body

*On the derivation of the word, however, consult the New English Dictionary and the Century Dictionary.

being stems of plants; borders are held together with twined weaving. In some specimens of openwork the warp of twined weaving is in pairs; but there are not shown in any of Keller's plates the types of twined work in which the warp plays any part for ornamentation; and in the remains, so far as examined, no attempts are made at embroidery, or overlaying, or any of the species of fine decoration, to be seen in the Alaskan or Californian weaving.*

In the Arabian Nights, the story of the lady who was murdered by her husband mentions a very large basket, by its size reminding one of the granary baskets of California, but it was evidently in coiled work, very much in the style of the Hopi plaques. The Caliph, Haroun Alraschid—

> came to the bank of the river, and the fisherman, having thrown in his net, when he drew it out again brought up a trunk, close shut and very heavy. The Caliph made the vizier pay the man 100 sequins immediately and sent him away. Mesrour, by his master's orders, carried the trunk on his shoulders, and the Caliph, eager to know what it contained, returned to the palace with all speed. When the trunk was opened, they found in it a large basket made of palm-leaves, shut up, and the covering sewed with red thread. To satisfy the Caliph's impatience, they cut the thread with a knife and took out of the basket a package wrapped in a sorry piece of hanging and bound about with rope, in which, when untied, they found, to their amazement, the dead body of a young lady cut in small pieces.

The Ute Indians in ancient times used basketry for mortuary purposes, but by them made of the rarest material and with faultless workmanship, adorned with symbols of their religion. The dead was covered with a large carrying basket, and all around were laid with loving care the finest specimens of the craft. (See Plates 205–211.)

It is interesting to know that the first mention of baskets in the Bible is in connection with dreams. Joseph was a

* Ferdinand Keller, The Lake Dwellings of Switzerland and other parts of Europe, 2 vols., London, 1878.

prisoner in Egypt. He had interpreted the butler's dream so favourably that Pharaoh's baker came also to him.

When the chief baker saw that the interpretation was good, he said unto Joseph, I also was in my dream, and, behold, I had three white baskets on my head; and in the uppermost basket [*sal*] there was of all manner of baked meats [sweetmeats] for Pharaoh; and the birds did eat them out of the basket upon my head. And Joseph answered and said, This is the interpretation thereof: The three baskets are three days; yet within three days shall Pharaoh lift up thy head from off thee, and shall hang thee on a tree; and the birds shall eat thy flesh from off thee.

It may in general be assumed that the baskets used by the Israelites were not unlike those of the Egyptians. If the ancient baskets of Egypt resembled the modern, those mentioned were of the coiled type, made from palm-leaf, resembling thick bread-plaques of the Hopi pueblos of Arizona. They were doubtless in use throughout North Africa long before the days of Joseph.

Specimens of this type of ancient coiled basketry were dug up by Randall-MacIver and Wilkin at El Armah, six miles south of the site of Abydos, in middle Egypt. They are the oldest that have yet been found in the world. El Armah dates back to the earliest "new race," through the entire middle period down to the late prehistoric in Egypt. Far up the Nile, the type persists. It will be seen in abundance at Aden, and it exists in much more elegant material in Hindustan. This proves the persistence of a single type through six thousand years. Long ago, caravans took it into the heart of Africa, and the reader must not be surprised further on in discovering at least a limited sphere of influence for it in America, where the descendants of the Moors who invaded Spain left it.

The Greek word for basket is kaneon, or kanastron, from kanna, a reed, whence our cannister, through the Latin can-

istra. Or, to come closer to our theme, basketry was made long ago in the warmer countries of the Old World, as it is now in the New, from cane. In the time of Homer, this word was applied frequently to receptacles of clay, bronze, and gold. Doubtless, in earlier ages, the Greek women were nimble-fingered basketmakers, but the forms are not preserved.

Wherever civilisation has come in contact with the lower races, whether in Britain, Africa, Polynesia, or America, it has found the woman enjoying the most friendly acquaintance with textile plants and skilful in weaving their roots, stems, and leaves into basketry, matting, and other similar products without machinery. Basketry was wellnigh universal throughout the Western Hemisphere before the discovery, while at least one-half of the area was devoid of pottery.

Ancient cemeteries, mounds, caves, ruins, and lake dwellings gave evidence of the high antiquity of the art in both continents. The researches of Holmes and Willoughby on mound pottery; of Yarrow and Schumacher in southwestern California; of Cushing, Fewkes, and Hough in ancient pueblos; of Nordenskjöld and Pepper in the cliff dwellings of the Southwest; of George A. Dorsey, of the Field Columbian Museum, and many European explorers in Peru, demonstrate that no changes have taken place in this respect, either in the variety of the technical processes or the fineness of the workmanship. There is an unbroken genealogy of basket-making on the Continent, running back to the most ancient times.

For a time cheap patented ware made from veneering threatened to obliterate the ancient plicated basket, but at the same time the latter became exalted to a pastime and a fine art, and there were never so many genuine lovers of the handicraft as at present.

In the past few years a sympathetic spirit has been awakened in the United States to keep alive this charming aboriginal art and to preserve its precious relics. In every State in

the Union will be found rich collections, both in public and private museums. People of wealth vie with one another in owning them. It almost amounts to a disease, which might be called "canastromania." They resemble the "merchantman seeking goodly pearls, who, when he had found one pearl of great price, went and sold all that he had and bought it." The genuine enthusiasm kindled in the search, the pride of success in the acquisition, the care bestowed upon them, witness that the basket is a worthy object of study. The story is told of a distinguished collector who walked many weary miles to the shelter of a celebrated old weaver. He spent the day admiring her work, but still asking for something better. He knew that she had made finer pieces. At last flattery and gold won. She tore out the back of her hut, and there, hid from mortal eyes, was the basket that was to be burned at her death. Nothing could be more beautiful, and it will be her monument.

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INDIAN BASKETRY

INDIAN BASKETRY

Studies in a Textile Art Without Machinery

CHAPTER I

Definition of Basketry

A place for everything.—Franklin.

BASKETRY is the mother of all loom work and beadwork. In that elaboration of industries through which they pass from naturism to artificialism, from handwork to machine work, from human power to beast power, wind power, water power, steam or fire power, and electric power, the loom is no exception. The first and most versatile shuttles were women's fingers. Machinery has added speed. But there are many niceties of technic to which the machine device can not yet aspire.

Over and above the sympathetic spirit engendered and the kind encouragement given to exquisite and most worthy artists by the collection of basketry, the study is a very important one from the side of culture. It is the alpha of an art in which billions of capital are invested, millions of human beings are employed, whose materials and products are transported to earth's remotest limits, whose textures are sought by every tribe of mankind. It is from this last point of view that the present work is written.

The praises of men who invented the cotton-gin, the power loom, and the tapestry loom will be repeated, and monuments erected to memorialise those who harnessed the forces of nature to do their bidding. Here a good word is said for the earlier, more primitive women who made the others possible.

It is true that pride in the ownership of an exquisite piece of work may be joined with frigid indifference toward the maker. It is to be hoped that with admiration of American basketry may be coupled a humane feeling for Indian women themselves, who have made so much genuine pleasure possible.

American basketry, ancient and modern, may be studied under the following subdivisions:

I. Definition of the art, its materials, tools, processes, and products.
II. Materials for basketry, with lists of plants, animals, and minerals, including the Indian name, common names, and scientific names.
III. Basket-making or construction.
Harvesting materials, with account of tools and apparatus.
Preparing materials, including the tools and processes, peeling, splitting, making splints, shredding, soaking, cleaning, yarning or twisting, twining, braiding, gauging, and colouring (dyeing).
Processes of manufacture—tools, apparatus, and patterns.
Braiding, checkerwork, wicker, twilled, wrapped woof, twined, and coiled, and checks, decussations, meshes, and stitches. Women at work.
IV. Ornamentation on basketry.
1. Forms and structure in baskets.
2. Mosaic elements in decoration.
3. Design in technic and colour.
V. Symbolism, also absence of, and meanings.
VI. Uses of basketry.
VII. Ethnic varieties and culture provinces, ancient and modern. Indian names.
VIII. Collections, public and private.
IX. Bibliography.

For convenience, American basketry may be compared in the following-named regions:—

1. Eastern region: Canada, Eastern States, Southern States, Western States.

2. Alaskan region: Interior Alaska, Arctic Alaska, Aleutian Chain, southeastern Alaska, Queen Charlotte Archipelago.

3. Fraser-Columbia region: Fraser drainage, Columbia drainage.

4. Oregon-California region: Southern Oregon, California.

5. Interior Basin region: Between Rocky Mountains and the Sierras.

6. Middle and South American region: Mexico, Central America, eastern and western South America.

These regions must be regarded only as convenient divisions for reference. The last named is a measure of ignorance, rather, for it could easily be divided into half a dozen regions. Again, before the balance of savagery had been violently disturbed by the discovery of the hemisphere, there were migrations of native blood and speech and arts. Basketry further on will be witness to many of these.

Basketry is differentiated from network by the fact that the meshes of the latter are not formed by decussations, but by knots; and from loom products, not only by the material, which is usually less rigid, but by the workmanship, which is done by machinery. Needlework is approached in coiled basketry, and beadwork borrows from all weaves. No wide gulf separates the different varieties of textiles, however, beginning with such coarse products as brush fences and fish weirs and ending with the finest lace needlework.

In form, basketry varies through the following classes of objects:

1. Flat mats or wallets, generally flexible.

2. Plaques or food plates, which are slightly concave. These occur in quality ranging from that of the coarsest sieve to that of the sacred meal tray.

3. Bowls for mush and other foods and for ceremonial purposes, hemispherical in general outline.

4. Pots for cooking, with cylindrical sides and rounded or flat bottoms. These vary into cones, truncated cones, and trough-shaped baskets.

5. Jars and fanciful shapes, in which the mouth is constricted, frequently very small, and now and then supplied with cover. They are spindle-shaped, pyriform, napiform, and, indeed, imitate fruits known to the natives. The influence of civilisation in giving modern shapes to basketry has not always been beneficial to this class of forms.

W. H. Holmes, writing of the transition from service to decoration, speaks of form in and on basketry as (1) functional and essential only, (2) functional and esthetic combined, and (3) as suprafunctional and wholly esthetic.

There are two distinct types of technic in basketry, namely, (1) hand-*woven* basketry, which is built on a warp foundation, and (2) sewed or *coiled* basketry, which is built on a foundation of rods, splints, or straws.

KINDS OF WOVEN BASKETRY

A. Checkerwork: The warp and the weft having the same width, thickness, and pliability.

B. Diagonal, or twilled basketry: Two or more weft strands over two or more warp strands.

C. Wickerwork: Inflexible warp; slender, flexible weft.

D. Wrapped weft, or single weft wrapped: The weft strand is wrapped, or makes a bight about the warp at each decussation, as in the Mohave *Kiho*.

E. Twined or wattled basketry: Weft of two or more elements.

KINDS OF COILED BASKETRY

A. Coiled work without foundation.
B. Simple interlocking coils.
C. Single-rod foundation.
D. Two-rod foundation.
E. Rod-and-welt foundation.
F. Two-rod and splint foundation
G. Three-rod foundation.
H. Splint foundation.
I. Grass-coil foundation.

K. Fuegian coiled basketry (See p. 103.)

These will be described at length in the proper places.

In basket-making there are several characteristics to be observed which will enable one to classify the objects and to refer them to their several tribal manufacturers. These characteristics are the material, the framework, the methods of weaving, the coiling or sewing, the border, the decoration, the use, etc.

The tool almost universally employed in the manufacture of coiled ware is a bone awl or pricker. Of the manipulation of the material previous to the weaving little is known.

In some of the technical drawings accompanying this work the actual size of the specimens is indicated by a series of inch marks in the margin. The inches on the standard line are shown by spaces between dots. In order to indicate exactly the manner of weaving, a rectangle, usually an inch in dimension, is taken from a portion of the surface wherein all the methods of manipulation occur. This part is enlarged sufficiently to make the structure comprehensible. This plan enables one to show form and ornamentation in the whole figure, as well as the method of treatment in the enlarged inch.

The writer is indebted to a large number of friends in various parts of the United States, especially on the Pacific slope, who have given him access to their valuable collections, furnished information, and sent photographs. Especial thanks are due to F. V. Coville for writing the chapter on plants, to William H. Holmes for advice in matters of ornamentation, and to C. Hart Merriam for privilege of studying the precious collection made by him. Many friends who have generously given their special knowledge and supplied photographs and illustrations will be mentioned in the proper place. At the same time he would express his admiration of their zeal and generosity, through which the Sibylline leaves of an almost lost chapter in human industrial history has been rescued from oblivion.

With a few exceptions, the makers of baskets are women.

In the division of labour belonging to the lowest stages of culture the industrial arts were fostered by women, the military and aggressive arts by men. It is a well-known rule in these first stages of progress that, with few exceptions, the user of an implement or utensil was the maker of it. There are people on the earth among whom the men are the basket-makers. Indeed, for ceremonial purposes, our own Indian priests or medicine men are frequently the makers of their own basket drums, etc.

As soon as the products of this art entered into the world's commerce, and uncanny machinery was necessary for the manufacture, the art of basket-weaving passed from the hands of its foster mothers and became man's work, but in the Western Hemisphere almost exclusively the basketmakers have been women.

It is a matter of profound regret that already over much of the United States the art has degenerated, or at least has been modified. In methods, forms, and colours truly, old things have passed away, and, behold, all things have become new. But proof is forthcoming that the contrary is true in some places. The Hyde Expedition and other associations have made determined efforts to resist the demoralising influences of trade.

This process of extinction has gone on with differing rapidity in the several areas. Nothing ancient in mechanical processes, in form, and in design can be predicated of the basketry sold at summer resorts. The trees are felled by the white man and the trunks divided into ribbons by his latest machinery. The Indian woman uses a steel gauge to regulate the width of her weft, steel awls for sewing. Even in western ware the demand and influence of mercenary motives drown the cry of the ancient spirit in the lowly artist. Plate 1 will show the conflict for preëminence between the old and the new. Dogs and horses are mingled with designs older than the Discovery. (See also Plates 42, 168.)

Plate 1. See page 8

NEW DESIGNS OBTRUDING THEMSELVES AMONG THE OLD IN COILED BASKETRY

Photograph from A. C. Vroman

But it is not alone the unrefined public who eliminate the delightful classic from the decoration of basketry; men and women with the most exalted motives have for centuries substituted European and Asiatic forms for aboriginal in basketry.

Plate 2 is worthy of notice in this regard. Eliminate the human figures altogether as realistic and as without standing in an art whose designs are preëminently symbolical. The other figures are divided into two series, those bearing some suggestion of ancient patterns and those covered with classical fretwork as the underlying motive, which then runs wild with savage freehand. (See also Plates 50, 58, 233.)

The reason for the genuine unspoiled art of the tribes in northwestern California is given by Carl Purdy. The Franciscan fathers who built the missions in the central and southern portions of the State never penetrated those wilds; the traders of the Hudson's Bay Company, whose presence and traffic changed the arts of other Indians so profoundly, did not come so far south, and Mexican soldiers were driven out of the country. It was not until settlers in the middle of the last century began to maltreat the Indians that bloody conflicts arose which resulted in their present status, but, fortunately, those pioneers had no interest in baskets, and probably did not notice them. There are in possession of old families in the eastern States baskets sent home by the Forty-niners that now are worth their weight in gold. The forms and designs on these are similar to many still made. This indicates that the art has kept its old-time purity.

It must be distinctly understood that many basket-making Indians are not now in their priscan homes. Besides the migration occasioned by the ordinary motives operating on the minds of the savages, the rapid intrusion of white settlers and the strong arm of the Government have hastened such movements. For our purposes, these compulsory migrations must be noted, specially in the case of basketmakers. For example, on the Round Valley reservations in northern Cali-

fornia are the Concow (Pujunan); and from the eastern side of the Sacramento Valley, the Nomelakki and Wailaki (Copehan), Little Lakes (Kulanapan), Ukie (Yukian), and Pit Rivers (Palaihnihan), belonging to five absolutely different linguistic families. Now, in a collection of baskets from Round Valley, one must not be surprised to find shapes, uses, decorations, and names for the same form or part or design extremely varied and mixed.

The author is aware that he has come far short of doing justice to his theme. Omissions will be noticed, and it is feared that some references of work to the wrong band or tribe have been made. This is unavoidable in a great museum. It is only in such rare collections as have been gathered with one's own hands that errors can be avoided.

Vocabulary of Basketry

So much is said and written on the subject of Indian basketry that a vocabulary is desirable. On some terms all are even now agreed. All things considered, words in common use should be adopted. There are, as before mentioned, two absolutely different kinds of technic employed, dividing basketry into *woven* and *coiled*. The former leads to the loom, the latter to the needle. It is not correct to speak of warp and weft in the latter—only in the former; the parts of coiled basketry are the *foundation* and the *sewing*. The following terms and definitions are suggested, not arbitrarily, but subject always to amendment and common consent. Words from Indian languages are purposely omitted. A few of them, however, ought to be retained, such as "tee," for the Pomo twined weaving:

Basket.—A vessel or receptacle in textile material; a technic product resembling this.

Basketry.—A general term including (1) basket-making, the process or art; (2) basketwork, the technic or stitches, any textile motive resembling work in baskets; (3) basket-ware, a collection of finished products.

Plate 2. See page 9

PIMA BASKETRY, ARIZONA

Showing new designs mixed with world-wide and old Indian designs

Collection of J. W. Benham

Beading.—A strip of bark or a splint run in and out through the spaces in woven or among the stitches in coiled basketry.

Braidwork.—Fabric in which three or more elements are braided, as in some three-strand twined basketry. See *False braid.* Preferred to the word plaited. There may be flat, round, or square braid. The term sennit is also allowable.

Button-hole stitch.—A series of half stitches, as in Fuegian coiled basketry.

Check.—Where warp and weft cross.

Checkerwork.—Basketwork in which the warp and weft are equally flexible, and the checks are square, or at least rectangular.

Chevron.—V-shaped ornament, in which two or more coloured lines meet at an angle; for example, the device on the sleeve of a non-commissioned officer. (See *Herringbone* and *Zigzag.*)

Chinking.—Soft materials between hard stems in the foundation of coiled basketry.

Coil.—An element in basketry ornamentation. The varieties are plain coil, reversed coil, loop coil, continuous loop coil.

Coiled basketry.—Type of basketwork in which a foundation of hard or soft material, arranged in a spiral, is held together by means of over-and-over sewing.

Crossed warp.—Type of basketwork in which two sets of warp cross each other at an angle—for interlacing weft, for seizing or wrapping (Makah), or for twined weaving, common in Attu wallets.

Decussations.—Crossing of warp at acute angles.

Diagonal weaving.—Passing weft over two or more warp elements, but not the same in adjoining rows. Used here chiefly of twined weaving, to distinguish it from twilled weaving with single weft element; also running the weft at an angle, as in matting.

Diaper.—A surface decoration which shows a pattern by the relief or direction of warp and weft.

Designs.—Figures and patterns used in the ornamentation of basketry. Must not be confounded with *Symbol.*

Embroidery.—Ornamentation added after the basket is finished. (See *False embroidery.*)

Faggoting.—Same as *Hemstitch.*

False braid.—An appearance of braidwork on the margin of a basket made with a single splint in ball stitch or "racking-seizing."

False embroidery.—An appearance of embroidery made on Tlinkit and other twined ware by wrapping the strands on the outside with coloured material in the process of weaving.

Fiber.—A flexible substance composed of filaments such as cedar bark, wild hemp, etc.

Frap.—To bind one element about another.

Fret.—The Greek ornament occurring in endless variety on basketry.

Furcate.—Said of stitches in coiled sewing intentionally and symmetrically split—bifurcate, trifurcate, etc.

Fylfot.—Ornament imitating a Greek cross with arms extended at right angles, all in the same direction; called also Swastika.

Gorrita.—The shallow basket bowl of the Pimas and other southwestern tribes.

Hemstitch.—Drawing warps together in groups of two or more and holding them by twined weavings. Seen in Aleutian openwork wallets. Called also *faggoting.*

Herringbone.—Basketry designs in which chevron patterns are in parallel series.

Herringbone border.—On coiled basketry, a finish in which with a single splint the appearance of 3-ply braid is given. (See *False braid.*)

Hitched weft.—Basketwork in which the weft makes a half hitch about each warp element. In coiled work it would be hitched sewing, same as button-hole stitch.

Hurdle.—A coarse form of basketwork in brush and trees for hunting and fishing purposes.

Imbricated ornament.—Coiled basketry in which a strip of soft material is folded back and forth over the stitches, overlapping like shingles on a roof or the folds in knife plaiting. Klikitat and Fraser River basketry are imbricated.

Impacted.—Driven close together, as the weft or stitches in basketry.

Inset.—A pattern worked separately into a basket. The Chilkat blankets are thus woven.

Interlacing.—The crossing and intertwining of parts, as in woven baskets and borders.

Knife plaiting.—See *Imbricated ornament.*

Lattice weaving.—Basketwork in which a frame of rods crossing at right angles is held together by wrapping the intersections with a single splint or ribbon, as in Makah basketry, or by a twined weft, as in the Pomo Tee weaving.

Multiple coil.—The foundation of coiled basketry made up of filaments, grass stems, or splints.

Muskemoot.—Loucheux netted bags of babiche. Coiled work without foundation.

Meander.—Crossed frets in basketry ornament.

Oblique weaving.—Chiefly in matting, where the weaving begins at one corner. Also oblique weft. Charming beadwork is thus made.

Osier.—Basket materials prepared from small stems of willow or similar plants. Shoots of dogwood (*Cornus stolonifera*) are called red osier.

Overlaying.—Laying a split straw or other coloured material on a tough weft splint or sewing-material in basket-making, to take the place of coloured bark. If the two are not twisted on each other, the figure does not show inside the basket.

Padding.—Soft material in the foundation of coiled basketry, helping to make the structure water-tight. (See *Chinking.*)

Pentacle.—In basket ornament, a 5-pointed star, whose lines inclose a pentagon.

Pierced warp.—The form of weaving in cattail and other

soft material when the weft strings pass through the warp. The warp stems are strung on the weft strings.

Ply.—Warp is two-ply when one of its filaments stands in front of the other. Used in weaving double baskets, or to bring the glossy side of the strands or splints outward, both on the right side and the wrong side.

Radial warp.—The arrangement of warp elements or spokes in the bottom of a cylindrical basket. They may be (1) crossed, (2) cut away, or (3) inserted. Radial patterns or designs are such as proceed from the central portion of a bowl-shaped basket outward to the border.

Scrollwork.—Imitation of art scroll on basketry. It is usually angular.

Sewing.—The joining of parts with an awl and splint. Coiled basketry is sewed, not woven.

Shoots.—The young and pliable growth of plants in the first year. Rough shoots, prepared shoots, and split shoots are used.

Shreds.—Irregular strips of plants used in foundations of coiled baskets.

Spiral.—Term applied in basket-making and decoration (1) To the whorled coil, wound about a center and receding, as in Hopi plaques, *flat spiral;* (2) to the helical coil, winding on a cylinder, *cylindrical spiral,* as in coiled jars; (3) to the conical coil, rising in a cone, *conical spiral.*

Splint.—In basketry, a long strip of split wood, uniform in width and thickness, for weaving or sewing materials. Often the term is more loosely applied to the split pieces that make up the foundation of coiled work.

Spoke.—Term sometimes applied to each of the elements in radiating basket warp.

Stalk.—The stems of reeds, grass, cattails, etc., for basket materials.

Stitches.—The separate elements in sewing coiled basketry. They may be close or open, whole or split (furcate), and interlocked.

Strand.—One of the elements of the warp or weft in basketry, which may be two-strand, three-strand, etc., when two or more are used.

Strip.—A narrow ribbon of leaf or other thin basket material answers in function to the harder splints.

String.—Two or more small yarns twisted together. The warp of twined wallets is of strings.

Symbol.—The meaning of a design on a basket. Care must be exercised in the use of this word. Only the maker of the design knows the symbol or meaning.

Tessellate.—Inlaid, as in checkered mosaic. The checks and stitches as well as the designs in baskets have a tessellate appearance.

Twine.—To bend something around another object. In basketry, to make twined ware in any of its varieties, plain, twilled, wrapped, latticed, three-strand, etc.

Warp.—The elements of woven basketry on which the fabric is built up; may be single or multiple, one-ply, two-ply or more, and laid parallel, decussated, latticed, radiated, zigzag, etc.; also a single one of these. (See *Spoke.*)

Wattling.—Coarse fence or fish weir in wicker or twined basketry.

Weft.—The filling of woven basketry, same as woof.

Weftage.—The texture of woven basketry.

Whip or *whipstitch.*—To sew with an overcast stitch, with long wrapping stitches. The sewing of coiled basketry may be so called. Borders of baskets are often whipped on.

Wickerwork.—Weaving in which the warp is rigid and the weft flexible.

Wind.—To wrap one element about another. Same as *Frap.* In Thompson River wallets, the twined weft is wound or frapped with corn husk.

Wrapped weft.—Basketwork in which the plain or twined weft is wrapped with soft decorative material.

Waterproofing.—Resin of the pine and mesquite for covering and lining basket jars, rendering them waterproof.

Woof.—See *Weft.*

Yarn.—Fibers twisted together, as in receptacles made from native hemp.

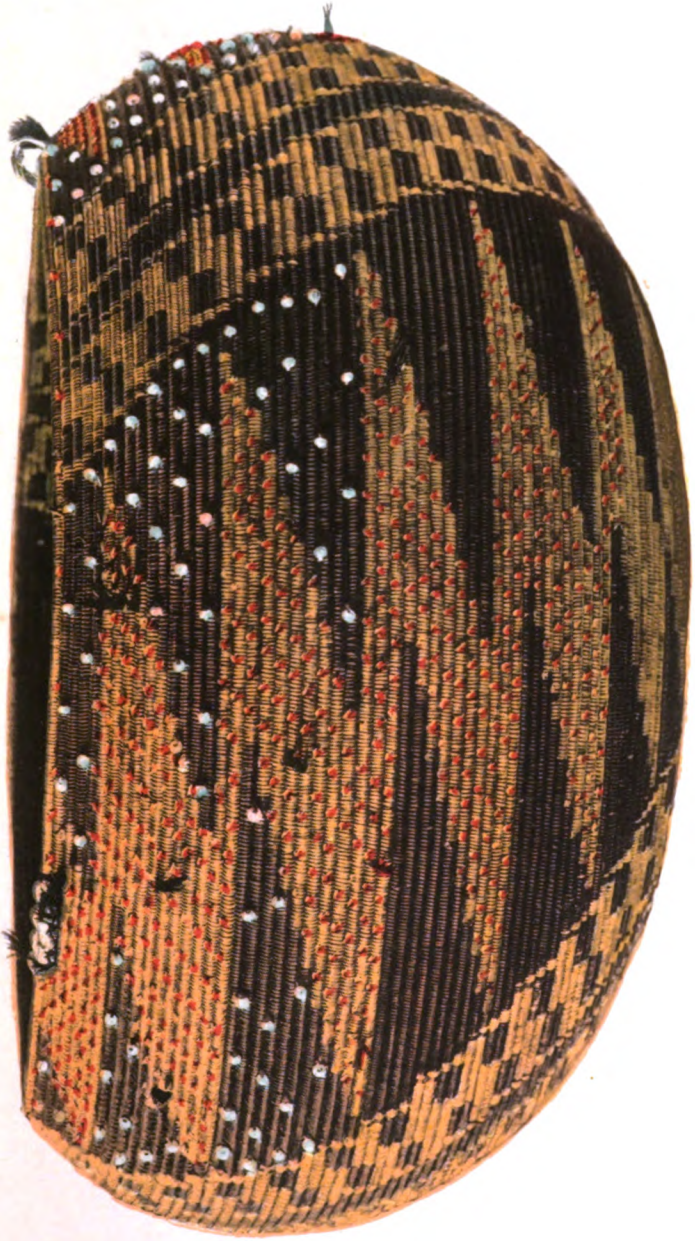
Zigzag.—A broken line of equal angular portions applied to structure or decoration in basketry.

Plate 3. See page 17

POMO TREASURE BASKET OF THE FINEST QUALITY

With added decorations of bits of feathers, quail plumes, shell money, and beads

Collected by J. W. Hudson



CHAPTER II

Materials for Basketry

Man is one world, and hath another to attend him.
—Emerson.

In the manufacture of their baskets, the Indians have ransacked the three kingdoms of nature—mineral, animal, and vegetal. For the first named, Cushing has shown how the Havasupai Indians line the inside of a basket with clay in order to render it fireproof. A great many of the paints or dyes with which the baskets are coloured are drawn from the mineral kingdom. In the decoration of basketry, beautiful stones and the mineral shells of mollusks are employed, either whole or cut into beads and pendants. (See Plate 3.)

Besides the beautiful shells, teeth, wings of insects, and other hard animal substances used for added ornaments, softer parts enter into the very texture of basketwork. In a few localities, the tribes have relied on them largely. It will be seen that wool of goat, sheep, and llama are treated in precisely the same manner as splints of wood. The undressed skins of smaller mammals, notably the rabbit, are cut into strings and twisted; and dressed hides into babiche to serve as weft in woven baskets and bags. Sinew thread was employed in making coiled basketry about the Great Lakes and farther north. But the most serviceable animal substance for basketry was the feather, its plume for decoration and its quill for hard work as well as ornament. Porcupine quills were likewise split and worked into coiled basketry, in addition to their embellishment of birch-bark utensils. The multitude of uses for feathers in this art will be described later.

The chief dependence, however, of the basketmaker is upon the vegetal kingdom. Nearly all parts of plants have been

used by one tribe or another for this purpose—roots, stems, bark, leaves, fruits, seeds, and gums. It would seem as though, in each area for purposes intended, the vegetal kingdom had been thoroughly explored and exhausted above ground and under ground. Is it not marvellous to think that unlettered savages should know so much botany? Mr. Chesnut, in his Plants Used by Indians of Mendocino County, California, calls attention to the fact that, in our advanced state, we are yet behind these savages, not having caught up with them in the discovery and uses of some of their best textile materials.

How did the savages find out that the roots of certain plants hid away under the earth were the best possible material for this function? And, for another use, the stem of a plant had to be found, perhaps miles away, so that, in the make-up of a single example, leagues would have to be travelled and much discrimination used. Unless the utmost care is exercised, the fact will be overlooked that often three or four kinds of wood will be used in the monotonous work of the weft. One is best for the bottom, another is light and tough for the body, a third is best for the flexible top. This, in addition to the employment of half a dozen others for designs, for warp or foundation, or for decorative purposes.

Among the basketmaker's materials must not be forgotten the demand for water-tight vessels. Besides the widely spread faculty of securing this result by texture, there were present in certain areas natural substances suitable for waterproofing, such as the gum of the pinyon (*Pinus edulis*), the resin of various pines, and even the mineral asphalt.

The making of canteens and other water vessels, in lieu of pottery, in this way was most prevalent among the Shoshonean tribes of the Interior Basin and the migratory Apache farther south. Barrows* calls attention to Humboldt's Essay on New Spain,† in which the Indians around Santa Barbara are

* The Ethnobotany of the Coahuilla Indians of Southern California, Chicago, 1900, p. 41.

† Vol. II, p. 297.

spoken of as "presenting the Spaniards with vases very curiously wrought of stalks of rushes," and covered "within with a very thin layer of asphaltum that renders them impenetrable to water."

The author is greatly indebted to Mr. Frederick V. Coville, Botanist of the Department of Agriculture, for the identification of plants used in basketry by the Indians of America north of Mexico. This list contains those that have been certainly identified. There are other plants alleged to be used in basketry, but of which no scientific determination has been made as yet. A complete discussion of this part of the subject would demand that, for each tribe making baskets, there should be a list of the plants employed by them, and for each plant used a list of the tribes by whom it is used. Such a discussion requires a long and tedious investigation by a number of talented workers coöperating. It is hoped that the chapter here given by Mr. Coville will be a starting-point for a complete study of Indian phytotechny.

Plants Used in Basketry

BY FREDERICK V. COVILLE

While some of the materials used by American Indian tribes in their basketry have long been known, by far the larger number had not been identified with precision prior to the beginning of the past decade. Most students of Indian plants had been satisfied with casual names applied by themselves or given to them by botanists after the examination of fragmentary specimens. Since the year 1890, a few botanists, notably Mr. V. K. Chesnut, of the Department of Agriculture, have turned their attention to the plants used by the aborigines and have made new records with definite identifications of the plants concerned, covering, among other subjects of Indian activity, that of basketry. When, therefore, after Professor Mason's invitation to prepare a chapter on the subject, the compilation of existing records was begun, it was

found that the earlier publications contained much that was indefinite, considerable that was incorrect, and a little that was both correct and exact. The notable exception to the general rule was the publication of Dr. Edward Palmer, whose work as a botanical collector in the western United States and Mexico extended from the late sixties of the last century to the present time. Under the circumstances, it was determined to admit only such matter as was capable of verification, based, first, on the writer's own observation; second, on published records that seemed to come under the last of the categories mentioned above; and, third, on the collections of the United States National Museum. A few unverified statements have been admitted for the purpose of bringing them to the attention of those who may be in a position to verify them. In the case of statements which did not originate with the writer, a parenthetic reference indicates the source of the information and, if published, the year of its publication. The work as here presented is recognised as by no means complete, but it is offered as a substantial basis for future investigation.

Acer circinatum. Vine Maple.

Lāl'shtl (Quinaielt).

Fresh twigs split into flat strips are employed by the Quinaielt Indians of the State of Washington in the construction of coarse twilled baskets for household use. (H. S. Conard, notes.)

Acer macrophyllum. Oregon Maple.

Pāl-gun'-shi (Yuki).

The Indians of Mendocino County, California, particularly the Concows, who now occupy a reservation there, use the white inner bark, preferably gathered in spring, in making baskets (V. K. Chesnut, 1902). From its inner bark, the Indians of the Pacific slope make baskets so closely woven as to hold water (J. T. Rothrock, 1867).

Adiantum pedatum. Maidenhair Fern.

The slender, black or dark brown, shining stems, after splitting, are used by the Indians of Mendocino County, California, in the ornamentation of some of their baskets, particularly those worn as hats (V. K. Chesnut, 1902). The Hupa Indians of Humboldt County, California, and other nearby tribes, use the stems in the same way. The practice extends also to the Snohomish Indians of western Washington (C. M. Buchanan, letter) and to the Tlinkit Indians of southern Alaska (G. T. Emmons, 1903).

Agave deserti. Desert Agave.

In the coiled basket bowls of the Coahuilla Indians of southern California, the cleaned fiber from the leaves is used to form the first few turns of the coil, which is then continued with grass stems. Evidently the grass is not sufficiently flexible to make these first turns without breaking, but the Agave fiber answers the purpose admirably (Cat. Nos. 207580 and 207581, U.S.N.M.). Some of the basket hats of the Diegueño Indians of San Diego County, California, are woven from cords made of the cleaned and twisted fiber, and from their great strength must be almost indestructible by any ordinary wear (Cat. No. 19751, U.S.N.M.).

Alnus oregana. Red Alder.

Among the Hupa Indians of northern California, the roots are sometimes used as weft at the beginning of a basket and in a round between the bottom and the sides (P. E. Goddard, notes). Various species of alder have been used by the American aborigines to produce an orange or red-brown dye, and, among a few tribes, these are known to be used for dyeing basket materials. Among the Tlinkit Indians of the south Alaskan coast, dye-pots were formerly made from the wood of this species, and the colour secured in this way was often heightened by adding pieces of the bark itself (G. T. Emmons, 1903).

Alnus rhombifolia. White Alder.

Among the Hupa, Yuki, and other Indians of northern California, a basket dye is obtained from the bark of this alder by infusion in water, or sometimes the bark is chewed and the material to be dyed is drawn through the mouth.

Amaranthus palmeri. Amaranth.

Ko′-mo (Hopi).

This is the source of a pink to purple dye used in the coiled and wicker plaques of the Hopi Indians of northern Arizona (W. Hough, notes). The identification is by C. F. Millspaugh.

Amelanchier alnifolia. Sarviceberry.

Ĭ-ta′-gë (Apache).
Chak (Klamath).

The small, straight, peeled branches of this and other species of Amelanchier are used by the Apaches of the White Mountain Indian Reservation, Arizona, to form the uprights in their large carrying-baskets, a use for which the very tough wood is well adapted. The Klamath Indians of Oregon often weave a stout branch, peeled or not peeled, into the rims of their large coarse baskets to stiffen and strengthen them.

Apocynum cannabinum. Indian Hemp.

The well-known Indian hemp, including a number of plant forms once referred to *Apocynum cannabinum*, but now treated as belonging to several species, occurs from the Atlantic to the Pacific coast, and was and still is widely used by the aborigines in the making of many kinds of cordage articles. It is commonly cited as an Indian basket material, and, although it has not been possible to secure a verifiable record of its use in a basket, it is altogether probable that some of the strings and cords so frequently used in beginning a basket, or in making the carrying-loops, are twisted from the inner bark of this plant.

Artemisia ludoviciana. Wormwood.

Hang-al (Coahuilla).

In that portion of the Colorado Desert of California known as the Cabeson Valley the Coahuilla Indians make from the stems of this plant the large granary baskets in which they store seeds and other dried vegetable foods (D. P. Barrow, 1900). The plant was identified by W. L. Jepson.

Arundinaria tecta. Cane.

The split outer portion of the stems of the cane was the favourite basket material of the Southern Indians, including the Choctaws, Chickasaws, Cherokees, Creeks, Seminoles, and other tribes from Texas and Arkansas to the Carolinas, and it is still in use among the remnants of these peoples. The handsome baskets of the Chetimacha and Attakapa Indians of Louisiana are made from split cane.

Berberis nervosa. Oregon Grape.

Among the Hupa Indians of northern California a yellow dye is obtained by steeping the twigs and bark of one of the species of evergreen barberry, or Oregon grape (Mary H. Manning, letter). Leaves of squaw-grass (*Xerophyllum tenax*) dyed with this are sometimes used in the yellow patterns occasionally seen in the Hupa hat baskets. The same material and dye are used in the huckleberry and other baskets of the Quinaielt (H. S. Conard, notes), Snohomish (C. M. Buchanan, letter), and Klikitat Indians of western Washington. The particular species used has been definitely identified in one instance as *Berberis nervosa*. Another species, *B. aquifolium*, is undoubtedly used also.

Betula populifolia. White Birch.

The soft wood of this tree is still employed in the north-eastern United States and Canada by the descendants of the Algonkin and Iroquois in the making of baskets (V. Havard, 1890). These baskets are thoroughly modernised, and

doubtless give little idea of the aboriginal methods of using this material.

Bromus sitchensis. Brome-grass.

The split stems are sometimes used by the Tlinkit Indians of the south Alaskan coast as an overlaying material for the white patterns of spruceroot baskets. (G. T. Emmons, notes.)

Butneria occidentalis. Calycanthus.

Sai ka-le′ (Pomo).

Both the wood and the bark from young shoots of this shrub are used in basketry by the Indians of Mendocino County, California. (V. K. Chesnut, 1902.)

Calamagrostis langsdorffii. Bluejoint.

Chu′-kan shark ki-kark-tush′ (Tlinkit).

The split stem is sometimes used for overlaying material in the spruceroot baskets of the Tlinkit Indians of the south Alaskan coast. (G. T. Emmons, notes.)

Carex barbarae. Sedge.

Ka-hum′ (Pomo).

The long, tough, woody, interior portion of the rootstocks of this sedge is used to form the white sewing-strands in the fine coiled baskets of the Pomo Indians of northern California. Among the neighbouring Wailakis the roots of another unidentified species of Carex are used in the same way, and the leaves are made into hats and crude, somewhat flexible baskets. (V. K. Chesnut, 1902.)

Carthamus tinctorius. False Saffron.

A-sap-zran′-ɪ (Hopi, from the Spanish).

This plant, introduced by the Spanish, produces a bright-yellow dye, used in basketry by the Hopi Indians of northern Arizona. (W. Hough, notes; Cat. Nos. 11,724 and 11,726, U.S.N.M.)

Ceanothus integerrimus. California Lilac.

Hi'-bi (Concow).

The long, flexible shoots are used in basket-making by the Concows of northern California. (V. K. Chesnut, 1902.)

Cercis occidentalis. Redbud.

Ché-e (Yuki).

The wood of the branches, with or without the bark, is used in basketry by many California tribes, notably by the Round Valley Indians of northern California (V. K. Chesnut, 1902). Among the Nishinam Indians of Bear Valley, Placer County, the willow foundations in certain coiled baskets are sewed together with a thread of redbud wood (Stephen Powers, 1877). The dark-red patterns in the baskets of the Pit River Indians and the Tulare Indians are formed from split branches with the bark left on.

Ceropteris triangularis. Goldenback.

This little fern, known usually as *Gymnogramma triangularis*, has a black stipe or stem which is sometimes used by the Round Valley Indians (V. K. Chesnut, 1902) and the Hupa Indians (Mary H. Manning, letter) of northern California as a substitute for maidenhair stems, when these are not available, in black basket patterns.

Chrysothamnus laricinus. Rabbitbrush.

Ma'-i-bi (Hopi).

The branches are sometimes used by the Hopi Indians of northeastern Arizona for the weft of their finer wicker plaques. (W. Hough, notes.)

Chrysothamnus moquianus. Rabbitbrush.

Ha'-no shi'-va-pi (Hopi).

The twigs are used at Oraibi, Arizona, to form the weft in the wicker plaques of the Hopi Indians (W. Hough, notes). The identification of the plant (U. S. Nat. Herb. 274,057) is by

E. L. Greene, the species being one closely related to the widely distributed *Chrysothamnus* [*Bigelovia*] *graveolens*.

Cinna latifolia. Wood Reed-grass.

Among the grasses employed by the Tlinkit Indians of the south Alaskan coast for the white patterns in their spruce-root baskets this species is the commonest. The part used is the stem, from which sections are split to be applied as an overlay on the spruceroot strands. (G. T. Emmons, notes.)

Cladium mariscus. Cladium.

From the tough interior portion of the rootstock is derived the surface material of the handsome coiled baskets, commonly called Tulare baskets, made by tribes on the lower Sierra Nevada from Fresno River to Kern River, California (C. Hart Merriam, 1903). Imperfect specimens of the plant, secured from the Indians by Dr. Merriam, have been identified by Miss Alice Eastwood as *Cladium mariscus*.

Corylus californica. Hazelnut.

Ol mam (Yuki).

The shoots of the hazelnut are used by many of the Indian tribes from northern California to Washington, west of the Cascade Mountains, in the making of baskets, especially as radials or uprights (Mary H. Manning, letter). The burden-basket, baby-basket, and salmon-plate of the Hupas are made entirely of the shoots of hazelnut. (P. E. Goddard, notes.) (See Plate 4.)

Covillea tridentata. Creosote Bush.

A gum-lac found upon the branches of this desert bush has a wide application among the southwestern Indians as a cement, and among the Cocopas of northern Lower California it is used for pitching baskets (E. Palmer). The gum, which occurs in conspicuous nodules of a reddish-amber color, is not a direct exudation from the plant, but is deposited by a minute scale insect, *Carteria larreae*.

Plate 4. See page 26

HAZELNUT (CORYLUS CALIFORNICA)

The main figure is a fruiting branch. Above at the left are two staminate catkins, with a pistillate flowering bud at their base, accompanied by a sectional view of a catkin scale and stamens, enlarged six times. To the right above are a terminal bud and a nut. Underneath the main figure are views of catkin scales and stamens, from front and back, six times natural size, and at the right a terminal cluster of pistillate flowers, enlarged three times. Except in the cases noted, the figures are of natural size.

Dasylirion wheeleri. Sotol.

The leaves, split into strands about a quarter of an inch wide and the coarse marginal teeth removed, are used among the Pima Indians of southern Arizona in coarse twilled baskets. (Cat. No. 218,027, U.S.N.M.)

Delphinium scaposum. Larkspur.

So-ro'-si (Hopi).

The flowers are the source of a light-blue dye used by the Hopi Indians of northern Arizona in their coiled and wicker plaques. (W. Hough, notes.)

Deschampsia caespitosa. Tufted Hair-grass.

Kût-kûk-kli'-te shark (Tlinkit).

This is one of the grasses the split stems of which are used among the Tlinkit Indians of the south Alaskan coast to form the white patterns on their spruceroot baskets. (G. T. Emmons, notes.)

Dondia suffrutescens. Sea-blite.

The Coahuilla Indians of the Colorado Desert in southern California blacken the stems of their basketry rush (*Juncus acutus*) by steeping them for several hours in a decoction of this plant (E. Palmer, 1878). The identification of the species is by W. L. Jepson.

Elymus mollis. Beach Rye.

The split stems of this grass are sometimes used for the white patterns in the spruceroot baskets of the Tlinkit Indians on the south Alaskan coast. This material is employed only for coarse work, and when other grasses better adapted for the purpose are not available. (G. T. Emmons, notes.)

Epicampes rigens. Epicampes.

In the region of the Mohave and Colorado deserts of southeastern California the Panamint, Coahuilla (D. P. Barrows, 1900), and other tribes use this grass for the packing of

their coiled baskets. The part used, at least in the better baskets, is that portion of the stem above the uppermost joint, which sometimes reaches a length of 45 centimeters (18 inches).

Equisetum palustre. Horsetail.

Dabts (Snohomish).
Hin-mûn-ĭ' (Tlinkit).

The rootstocks of this plant, which sometimes reach a diameter of 1.5 centimeters (⅔ inch) and a length of 20 centimeters (8 inches) between the joints, were used in the early days, though rarely now, in the patterns on spruceroot Tlinkit baskets of the south Alaskan coast, particularly among the Hoonah and Yakutat branches of the tribe. Strips are split from the surface of the rootstock and used as an overlaying material. The colour is a rich, very dark purple, which appears as a black. (G. T. Emmons, notes.) A similar use was made of the plant, in their cedar-root baskets, by the Snohomish Indians of Puget Sound, Washington (C. M. Buchanan, notes).

Equisetum robustum. Scouring Rush.

The coal-black surface of the rootstock is sometimes used by the Cowlitz Indians of southwestern Washington as a substitute for the rootstock of *Equisetum palustre* in the black overlay patterns on cedar-root baskets.

Evernia vulpina. Wolf Moss.

Se'-ho-lĭ (Tlinkit).
Swä'-u-sam (Klamath).

This yellow tree-lichen was widely used as a dye by the Indians of the timbered area of the western United States. The Klamath Indians of Oregon, as well as the Hupas of northern California (Mary H. Manning, letter), use this dye in their baskets, the colouring matter being extracted by boiling. In the case of the Hupas the dye is applied to Xerophyllum leaves, but the Klamaths use it only for the porcupine quills

Plate 5. See page 20

WOLF MOSS (EVERNIA VULPINA)

Used by Klamath, Hupa, and other tribes to produce a bright yellow dye

The lichens are shown as growing on a dead branch, their usual habitat. The plant at the right is in fruit, the shallow cups (apothecia) containing the brown spore-bearing surfaces.

Drawing by Frederick A. Walpole

which form the beautiful canary-yellow patterns of their twisted tule baskets. The Tlinkit Indians of the south Alaskan coast also use the dye in their spruceroot baskets, the lichen being secured by them not on the coast, but from the interior (G. T. Emmons, notes). (See Plate 5.)

Fraxinus nigra. Black Ash.

The remnants of the Six Nations in New York, Pennsylvania, and adjacent portions of Canada make extensive use of ash, presumably black ash, in their modern splint-basket industry. (T. Donaldson, 1894.)

Helianthus petiolaris. Sunflower.

A-ka'-u-shi (Hopi).

The seeds are used by the Hopi Indians of northern Arizona to make a blue dye for use in both coiled and wicker plaques (W. Hough, notes). The colour produced in the coiled plaques, on sewing-material of *Yucca glauca*, is of a dark, almost prussian, blue shade, when the sewing-strands are applied with their broken inner surface outward, but of a much lighter shade when the epidermal surface is outward (Cat. No. 128,708, U.S.N.M.).

Hicoria ovata. Hickory.

The wood of some unidentified species of hickory, probably *Hicoria ovata*, is employed among the remnants of the Six Nations in New York, Pennsylvania, and adjacent portions of Canada in the manufacture of modern splint baskets (T. Donaldson, 1894). The inner bark of a hickory is used by the North Carolina Cherokees for yellow patterns in their baskets (Cat. No. 63,077, U.S.N.M.).

Hilaria jamesii. Galleta.

Ta'-ka-shu (Hopi).

The stems of this grass, roughly stripped of leaves and seeds, are used for the filling in of the coiled plaques of the Hopi Indians of northern Arizona (W. Hough, 1898). In the first

few turns of the spiral, which are too short to be made of the grass stems, the packing is of shredded leaves of *Yucca glauca* (Cat. No. 128,467, U.S.N.M.).

Juglans nigra. Black Walnut.

The Cherokee Indians of North Carolina use the split inner bark to make black patterns in their baskets. (Cat. No. 63,077, U.S.N.M.)

Juncus acutus. Rush.

The Coahuilla Indians of the Colorado Desert, southern California, use the stems to make patterns in their coiled basket bowls. The material, as gathered in a marsh at Palm Springs, is immersed for several days in the muddy water of the spring to render it flexible, and is then dyed a dark olivaceous or almost black colour with the juice of a sea-blite. (E. Palmer, notes.) (See *Dondia suffrutescens.*)

Juncus balticus, Rush.

Tsin-a′-u (Klamath).
Kloh-tso′-sē (Apache).

The stems of this rush, which is commonly known as wire-grass, are often used by Indian children to make small baskets. The practice has been noted among the Klamaths of Oregon and the White Mountain Apaches of the Arizona plateau.

Juncus effusus. Rush.

Lal′-ûm (Yuki).

The stems of this rush, or wire-grass, are used among the Round Valley Indians of Mendocino County, California, to make temporary baskets, particularly in teaching the Indian girls the art of basketry. (V. K. Chesnut, 1902.)

Juncus textilis. Basket Rush.

The Luiseño Indians of southern California use the split stems of this rush as the sewing-material of their coiled baskets (C. Hart Merriam, notes). The varying natural colours of the stem at different heights produce a very attractive effect.

The herbarium specimens collected by D. P. Barrows, as illustrating the rush found by him, in use among the Coahuilla Indians of southern California in 1901, prove to be *Juncus textilis*. The stems, split in three strips, were used as a surface material of coiled baskets.

Juniperus occidentalis. Western Juniper.

K'ă'-hlo (Klamath).

Strips of wood split from the branches of this tree are sometimes used by the Klamath Indians of Oregon in coarse sieve baskets.

Larix laricina. Tamarack.

The Tinné Indians of the Upper Yukon River in Alaska and Yukon Territory use the roots of tamarack for their coiled basket kettles (Strachan Jones, 1866). There is doubt about the identity of the tree, because the true tamarack, *Larix laricina*, and the lodge-pole pine, *Pinus murrayana*, to which the name tamarack is often applied, both grow in the region.

Libocedrus decurrens. Post Cedar.

Wu'-lu-ansh (Klamath).

The split wood of this tree is occasionally woven into rough V-shaped pack-baskets by the Klamath Indians of Oregon.

Lonicera interrupta. Honeysuckle.

Hai-wat' (Yuki).

The long flexible stems are used to a slight extent among the Round Valley Indians of California in the coiled "one-stick" baskets, in which the foundation consists of a single stem. (V. K. Chesnut, 1902, and notes.)

Martynia louisiana. Devil Horns.

Ta-g'at'-ē (Apache).

This plant, which is often known in books as the unicorn plant, has a large green pod with a slender terminal projection. At maturity the green outer layer becomes dry and falls off,

Plate 7. See page 33

SITKA SPRUCE (PICEA SITCHENSIS)

From the slender roots the north Pacific tribes make thousands of baskets

Fig. *a*, twig with staminate catkins. Fig. *b*, pistillate catkins. Fig. *c*, cones approaching maturity. Fig. *d*, mature cone. Fig. *e*, inner view of a cone scale showing the position of the two-winged seeds. Fig. *f*, seeds. With the exception of fig. *e*, which is enlarged one and one-third times, the figures are reproduced eight-ninths their natural size.

Drawing by Frederick A. Walpole

c
b
a
e
f
d

(*Juncus acutus*) they use in basket-making by steeping it in water with the branches of this plant. (E. Palmer, 1878.)

Philadelphus gordonianus. Syringa.

Hân'lĭ (Yuki).

The pithy stems of this shrub, which is locally known as arrowwood, are employed by the Indians of Mendocino County, California, in the manufacture of baskets for carrying babies, a use to which the stems, on account of their lightness, are well adapted. (V. K. Chesnut, 1902.)

Phragmites phragmites. Reed.

Tkap (Klamath).

The white patterns in the twisted-tule baskets of the Klamath and Modoc Indians of Oregon are made from this reed. The part used is the shining surface layer of the stem, taken from less thrifty plants, particularly those which have produced no flower cluster. (See Plate 6.)

Phyllospadix torreyi. Phyllospadix.

Lŭk'-o-stap (Quinaielt).

The narrow flat leaves of this marine plant are occasionally used by the Quinaielt Indians of western Washington for black patterns in small flexible baskets overlaid with Xerophyllum leaves. The naturally dark colour is accentuated by burying the leaves in black mud. (H. S. Conard, notes.)

Picea sitchensis. Sitka Spruce.

Sit (Tlinkit).

The roots of this tree, boiled and split, are the basis material of the baskets manufactured by the Tlinkit Indians of Yakutat Bay, Alaska (F. Funston, 1896). The same use prevails among the Tlinkits of the Alexander Archipelago, notably those of Sitka, Juneau, and Douglas. The Quinaielt Indians (H. S. Conard, notes) and the Indians of Neah Bay, Washington, and doubtless other tribes also, use the split roots for their coarse burden-baskets. (See Plate 7.)

Pinus edulis. Arizona Nut Pine.

O-bĕ′ (Apache).

The Apaches of the White Mountain district, Arizona, use the resin of this tree, often called pinyon, as a pitching material for their water-baskets.

Pinus lambertiana. Sugar Pine.

Slender strands split from the root of the sugar pine, woven about uprights of California hazel, are the foundation material of the acorn-soup baskets of the Hupa Indians, northern California. To make them split more easily, the roots are steamed by burying them in sand and building a fire over them. (Mary H. Manning, letter.)

Pinus monophylla. Nevada Nut Pine.

The Panamint Indians of southeastern California use the pitch of this tree to make their water-baskets impervious to water.

Pinus ponderosa. Yellow Pine.

The split wood of the root is one of the materials used by the Hupa Indians of northwestern California for the principal part of the weft in closely woven baskets. (P. E. Goddard, notes.)

Pinus sabiniana. Digger Pine.

Pol′-kûm ol (Yuki).

The Little Lake Indians of Mendocino County, California, use the split roots to make their large V-shaped baskets for carrying acorns. The root is warmed in hot damp ashes, and the strands are split off before cooling (V. K. Chesnut, 1902). A similar use extends northward among the Hupa and other California coast Indians as far as Klamath River (V. Havard, 1890).

Populus trichocarpa. Balm of Gilead.

In northwestern California the Hupa Indians sometimes used the root to fasten the ribs of their baskets at the begin-

Plate 8. See page 36

Threeleaf Sumac (Rhus Trilobata)

The main figure is a branch in leaf and fruit. Above at the left is a single fruit enlarged one and a half times, and at the right a section of the same twice the natural size. At the left below is a flowering twig, and to the right are four views of flowers, enlarged four times, the two at the left showing the two forms of flowers, one without stamens.

Drawing by Frederick A. Walpole

ning and to form a round at the base of the sides of the basket. (P. E. Goddard, notes.)

Prunus emarginata. Bitter Cherry.

Some of the Indians of the Fraser River watershed in British Columbia use the thin tough outer bark of a subspecies of this tree, *villosa*, as an overlay for patterns in their narrow-bottomed quadrangular baskets. The patterns are either of their natural colour, chestnut brown, or black from the dyeing of the bark in mud or iron-water.

Pseudotsuga mucronata. Red Fir.

According to J. W. Hudson, the Pomo Indians of Mendocino County, California, use the roots of this tree in the manufacture of some of their fine baskets.

Pteridium aquilinum. Bracken.

Bĭs (Calpella).

A form of the common bracken occurring in the western United States is occasionally employed as a basket material among the Indians of Mendocino County, California (V. K. Chesnut, 1902). It is the material of the black designs in the coiled baskets of the Tulares and various other California tribes in the lower western slopes of the Sierra Nevada (C. Hart Merriam, 1903). The part used is the two flat strips of black hard-celled tissue in the rootstock.

Quercus alba. White Oak.

Splints from the wood of a white oak, presumably this species, are still used by the Cherokee Indians of North Carolina as the material for certain of their baskets. (Cat. No. 63,073, U.S.N.M.)

Quercus lobata. California White Oak.

The Concow Indians of Mendocino County, California, sometimes blacken their basket strands of redbud (*Cercis occidentalis*), on which the bark is still attached, by soaking

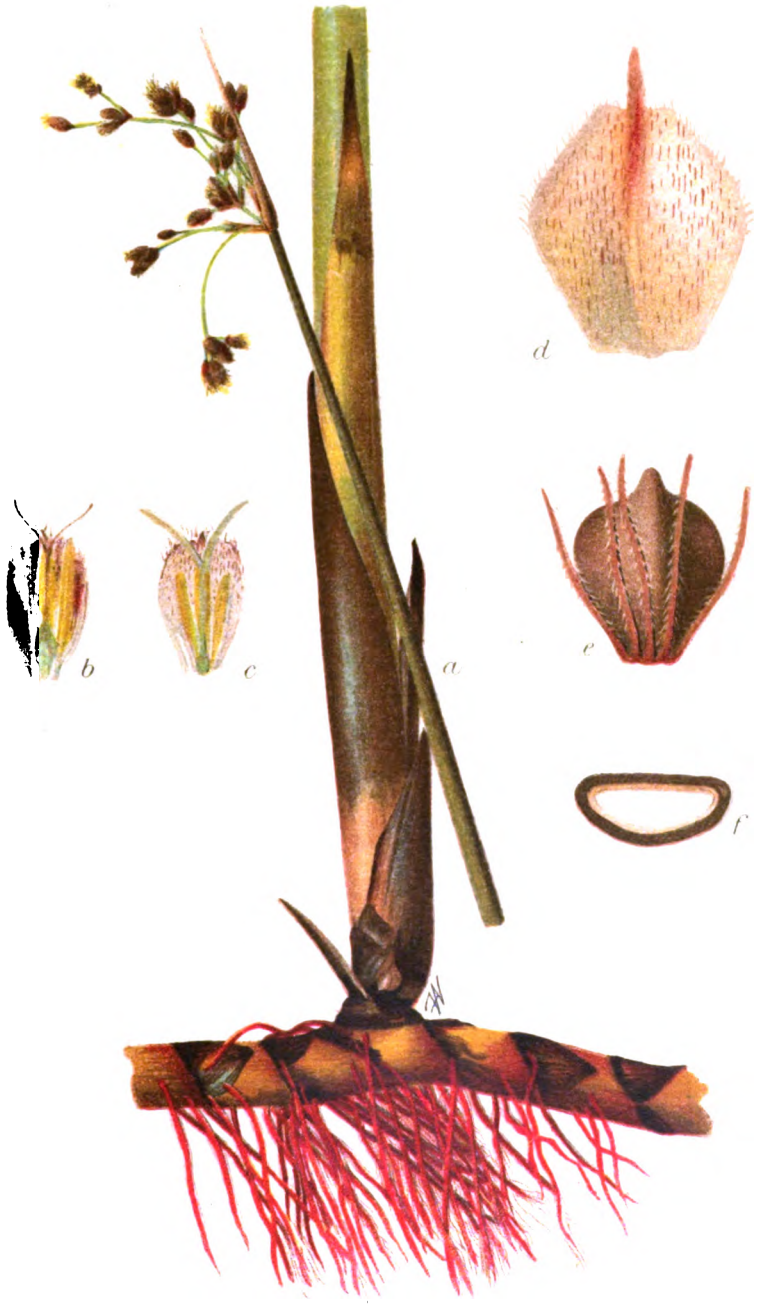
Plate 9. See page 38

TULE (SCIRPUS LACUSTRIS)

Stems used by Oregon and California tribes for weaving, and the bright red roots form patterns in basketry

Fig. *a*, rootstock, roots, sheathing base of the stem, summit of the stem, and inflorescence. Figs. *b* and *c*, flowers, from within, showing the scale behind. In *c*, the stigmas are mature, but the stamens not yet fully developed; in *b*, the stigmas have withered, the ovary enlarged, and the stamens matured. Fig. *d*, a scale, viewed from the back. Fig. *e*, a mature nutlet with its barbed bristles. Fig. *f*, a cross section of the nutlet. Fig. *a* is half natural size, figs. *b* and *e* five times enlarged, and figs. *d* to *f* ten times enlarged.

Drawing by Frederick A. Walpole


b
c
a
d
e
f

Zuñi of New Mexico; the Hupa, Yurok, Modoc, Chimariko, Gualala, Nishinam, and Yokut of northern and middle California, and the Tinné of the Yukon Valley, Alaska. The split roots of willow are sometimes used for the weft in beginning the hat baskets of the Hupa Indians (P. E. Goddard, notes).

Salix argophylla. Willow.

Bam ka-le′ (Pomo).

The Pomo Indians near Ukiah, California, consider this their best willow for the manufacture of coarse baskets. (V. K. Chesnut, 1902.)

Salix geyeriana. Willow.

Yas (Klamath).

Among the Klamath and Modoc Indians of Oregon this is the principal willow used in their coarser basketry, for pack-baskets, sieves, seed-beaters, and, in primitive times, plates. The shoots are the part employed, usually peeled and seldom split.

Salix lasiandra. Willow.

A willow, which is referable to *Salix lasiandra* in its broad sense, is used to some extent by the Panamint Indians of Inyo County, California, in their twined baskets, and by the Apaches of the White Mountain Reservation, Arizona.

Sambucus mexicana. Elder.

The Coahuilla Indians of San Diego County, California, give a deep black colour to strands of the three-leaf sumac, used as a sewing-material of their coiled baskets, by soaking them for about a week in an infusion of the berry-stems of this elder. (D. P. Barrows, 1900.)

Savastana odorata. Holy-grass.

The Indians of the northeastern United States and adjacent parts of Canada, such as the Penobscots of Maine (V. Havard, 1890) and the Abenakis of Ontario (Cat. No. 206,394,

U.S.N.M.), use the long sweet-scented leaves of this grass in some of their baskets.

Scirpus lacustris. Tule.

Ma'-ĭ (Klamath).

The principal basket material of the Klamath and Modoc Indians of Oregon is the tule, a plant widely used by the tribes of the Pacific coast States in the manufacture of mats. Narrow strips from the surface of the stem are twisted into long threads and these used for their finer twined baskets, giving a great variety of green and brown shades or, when dyed, a black. For coarser baskets whole or split stems are commonly employed, without twisting. The very slender roots of the tule, which occur in great abundance on the stout rootstocks, are used, without any other preparation than drying, to make patterns of a maroon colour in the twisted-tule baskets. (See plate 9.)

Scirpus maritimus. Bulrush.

Tsu-ish (Pomo).

The Pomo Indians of California use for the brown and black patterns of their fine coiled baskets a fiber extracted from the rootstock of this bulrush. Structurally the fiber is the same as that described under *Carex barbarae*. The identification is by Miss Alice Eastwood. A similar material, blackened by burying in wet ashes (C. Hart Merriam, 1903), is sometimes used for black patterns in the fine coiled baskets of the Panamint Indians of Inyo County, California.

Smilax californica. Greenbriar.

The long and exceedingly strong stems, brought from the watershed of the Sacramento River, are sometimes employed by the Indians of Mendocino County, California, in their basketry. (V. K. Chesnut, 1902.)

Thelesperma gracile. Thelesperma.

O-ha'-u-shi (Hopi).

A decoction of the whole plant was formerly used to give a red-brown colour to the stems of rabbitbrush (*Chrysothamnus*

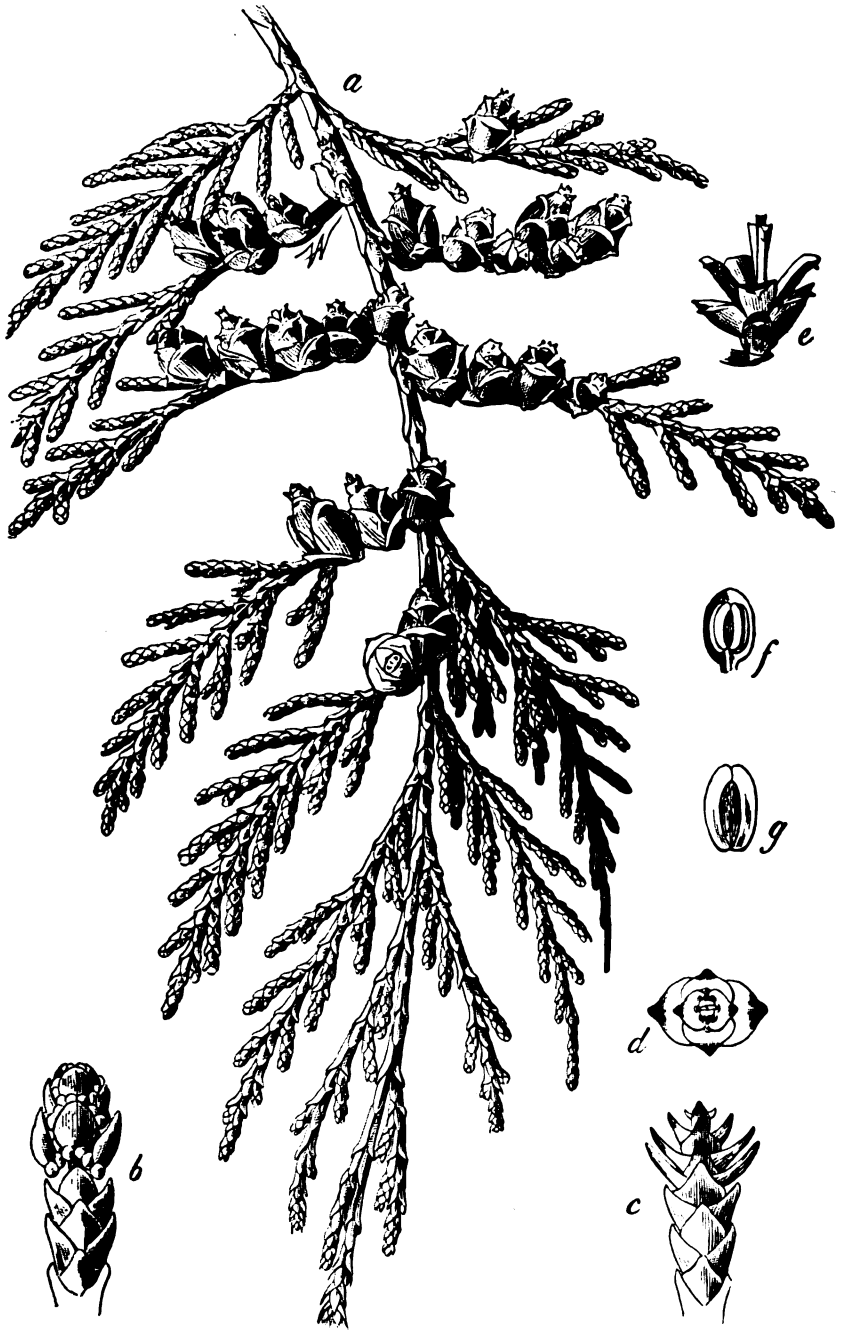


Plate 10. See page 39 GIANT CEDAR (THUJA PLICATA)

The large figure is a branch in its natural pendent position, with full-sized but not yet opened cones. Below at the left is the apex of a twig with staminate flowers, at the right a pistillate flowering twig, and above it an end view of the same, five times enlarged. Above at the right is a mature and opened cone, one and a fourth times enlarged, and below a cone scale, from within, showing the seeds natural size, and still lower a single seed twice enlarged.

moquianus) for the patterns in the wicker plaques of the Hopi Indians of northern Arizona. (W. Hough, 1898; Cat. No. 128,708, U.S.N.M.)

Thuja plicata. Giant Cedar.

The split twigs of this tree are employed as weft, with a spruceroot warp, in the strong coarse baskets used by the Quinaielt Indians of Washington for carrying firewood (H. S. Conard, notes). The split roots are the common sewing-materials for the strong, water-tight huckleberry baskets of certain tribes of the Northwest Coast from northern Oregon to British America, including the Klikitat, Cowlitz, Puyallup, Tulalip, Snoqualmie, Skagit, and Fraser River Indians. The Indians of Neah Bay, Washington, and of Vancouver Island, British Columbia, use the split brown inner bark as the warp of their finely woven but artificially dyed flexible baskets. The Nisqualli Indians of Puget Sound, and doubtless many other tribes of the Northwest Coast, employ the same material in coarser strands in making rough burden-baskets, frequently in conjunction with a warp of split branches from the same tree. (See Plate 10.)

Tsuga heterophylla. Western Hemlock.

Y'ghûn (Tlinkit).

The bark of this tree was formerly used by the Tlinkit Indians of southern Alaska in the preparation of certain dyes for the grass strands used in the overlay of spruceroot baskets. Black was sometimes produced by boiling the straw in the black mud of sulphur springs with salt water and hemlock bark, with the addition, after the introduction of iron, of pieces or scrapings of that metal. A greenish shade of blue was produced by boiling hemlock bark with oxide of copper scraped from old pieces of metal or from copper ore. (G. T. Emmons, 1903.)

Tsuga mertensiana. Black Hemlock.

The Indians of Neah Bay, Washington, sometimes use split hemlock roots in their coarse openwork quadrangular

V-shaped burden-baskets. The tree was described by a Neah Bay Indian as having cones 2½ inches long, in which case the species would be the black hemlock instead of the Western hemlock (*Tsuga heterophylla*), which is the commoner of the two at low elevations in that vicinity.

Tumion californicum. California Nutmeg.

K'o'-bi (Pomo).

The split roots of this tree are sometimes used by the Pomo Indians of Mendocino County, California, in the manufacture of their finer baskets. (V. K. Chesnut, 1902.)

Typha latifolia. Cattail.

Po'-pas (Klamath).

Twisted strands made of slender ribbons split from the sheathed portions of the leaves are used by the Klamath Indians of Oregon in their smaller flexible baskets, either to form the body of the basket or to make an ornamental band. The colour is a lusterless, slightly ashy white.

Ulmus americana. Elm.

The Sioux Indians of the northern plains region used the inner bark of the elm to make a coarse basket. (V. Havard, 1890.)

Urtica breweri. Nettle.

Slĕdsh (Klamath).

The Klamath Indians of Oregon make from the fiber of the inner bark of this nettle very strong cords which are frequently employed to bind together the warp strands at the beginning of a basket or to bind the interlaced ends of the warp at the finished margin.

Vaccinium membranaceum. Blueberry.

Ka-na-ta' (Tlinkit).

The boiled juice of some species of blueberry, probably *Vaccinium membranaceum*, is used as a purple dye in spruce-root baskets by the Tlinkit Indians of the south Alaskan coast. (G. T. Emmons, 1903.)

Vitis californica. Grape.

Shi-ĭn′ (Pomo)

Among the Hupa Indians of northern California the root is sometimes used to fasten the ribs of a basket at its beginning, and to make a round at the outer edge of the basket's bottom, while in fine hats grape root sometimes makes up the whole weft (P. E. Goddard, notes). Portions of the woody stem are used by the Pomos of Mendocino County, California, as a sewing-strand for attaching the rims to their pack-baskets. The grape strands completely cover the stout withe that forms the basis for the rim, making it more durable and at the same time thickening it so as to give a good means of firmly grasping the basket. (V. K. Chesnut, 1902, and notes.)

Woodwardia spinulosa. Giant Chain Fern.

The Hupa Indians of northern California use a portion of this fern, either white or dyed orange brown with alder bark, in the patterns of their hat baskets (Mary H. Manning, letter). The parts employed are two slender flat strands, very flexible and leathery when moist, which are extracted from the stalk of the frond.

Xerophyllum tenax. Xerophyllum.

The long, tough, minutely serrated, grass-like, lustrous leaves of this plant, often called squaw-grass, are very commonly used by the Indians of the Northwest Coast as an overlaying material to make the white patterns of their baskets. Occasionally it is dyed. The base of the leaf for an inch or more often has a natural faint purple colour which is used to good effect. The use of the material extends from the Pit River, Shasta, and Hupa Indians, in northern California, northward through most of the tribes west of the Cascade Range to the Neah Bay and Vancouver Island Indians of the Straits of Fuca. These last two use Xerophyllum leaves, cut to a uniform width by a gauged knife-edge, as the weft of their gaudily dyed flexible baskets.

Yucca arborescens. Tree Yucca.

In California the slender roots are used for red figures in baskets of the Kern Valley and Newooah Indians of the southern Sierra Nevada (C. Hart Merriam, 1903), and those of the Panamint Indians of Inyo County.

Yucca arkansana. Yucca.

The leaves are used in the basketry of the Kiowa Indians of Oklahoma. (J. Mooney, notes.)

Yucca baccata. Banana Yucca.

The Mescalero Apaches of southern New Mexico and adjacent parts of Texas, in the region between the Rio Grande and Pecos rivers, use the split leaves of this plant for the main portion of their baskets, and its roots for the red patterns (Cat. Nos. 204,646 to 204,653, U.S.N.M.). It is probable, I am informed by Mr. Vernon Bailey, that they use also in the same way the leaves and roots of *Yucca macrocarpa*, an arborescent species growing at lower elevations in the same region.

Yucca filamentosa. Silk grass.

The leaves of this plant were formerly in use among the Indians of North Carolina as a basket material. (J. Lawton, 1714.)

Yucca glauca. Plains Yucca.

Mo'-hu (Hopi).

This plant is used in the basketry of the Hopi Indians (W. Hough, 1902) of northern Arizona. In some of the coarser twilled baskets the warp and weft are made up of the narrow unsplit leaves thinned by the removal of a strip from the back (Cat. No. 213,254, U.S.N.M.). In the coiled plaques the sewing-material consists of narrow strips split from the leaves. The outer surface of the leaves gives various shades of green and greenish-yellow or, in the case of the young leaves, white, or they are dyed in several colours. The dyed strips are often applied with the inner, broken surface outward.

This surface takes the dye more readily and gives a deeper shade. For the use of the shredded leaves as a packing material in the first few turns of the spiral, see *Hilaria jamesii*.

Zea mays. Maize.

Some of the Indian tribes of the Columbia Plains, in Oregon, Washington, and Idaho, including the Yakimas, Warm Springs, Umatillas, and Nez Percés, use narrow strips from the husks of maize, or Indian corn, as an overlay for the white patterns in their trinket-bags.

CHAPTER III

Basket-Making

The sallow knows the basketmaker's thumb.—Emerson

Under the head of basket-making are included all the activities in and fostered by construction, namely:

1. *Harvesting materials.*—This embraces intimate acquaintance with the places where just the right substances abound, knowledge of the times when each element is ripe, methods of growing, harvesting, and conveying involved, as well as the tools and apparatus used in gathering. In their rough state much of the materials would be as unfit for the use as quarry clay would be for the potter or crude ore for the metallurgist.

2. *Preparing materials.*—Frequently the raw materials are stored away at the time of harvesting until required for manufacture. Nature makes the rules for gathering in her own good time. But this might be the busy season, whereas this art may go on in different seasons. When the time comes for their use, special manipulations are necessary, such as peeling, splitting, making splints, yarning or twisting, twining, braiding, soaking, gauging, colouring. These should each be noted carefully and described for the several basket areas.

3. *Processes of manufacture.*—The materials being ready, the maker seats herself in the midst and begins the technical operations that should be minutely watched, and photographed, if possible. Collections should also be made of tools, apparatus, and patterns.

Each of these will be examined with minute care, especially the third. If this art is to be imitated and become a stimulus in technical instruction, it is of the utmost importance that the substances be correctly known, that the manipulations of

materials be familiar, and, above all, that the course of each element in the warp and weft, the foundation, and sewing be understood. Care has been taken to draw correctly the figures used in illustration. They are all in the basketry of the Indians, and, more than that, they are the beginnings of more refined processes and structures.

Harvesting Materials

Since the materials used in basketry are derived from different parts of a great variety of plants, the gathering of them involves many industries. The harvesting of basket

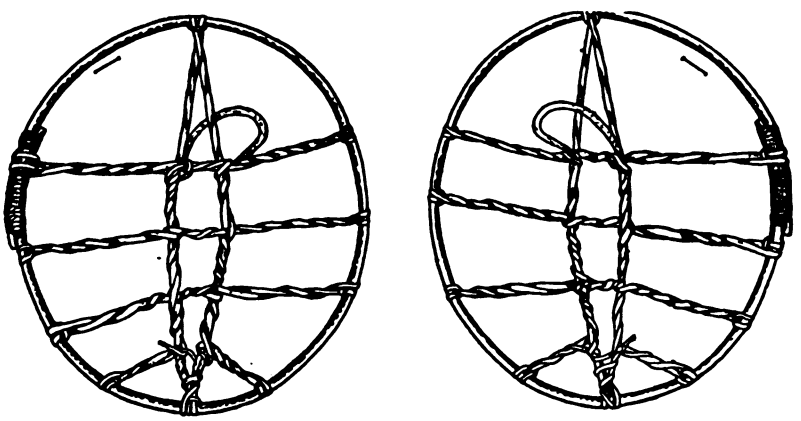


Fig. 1.
MUD-SHOES, CALIFORNIA.
Klamath Indians.
Cat. No. 24109, U.S.N.M. Collected by L. S. Dyar.

material is no exception to the rule that every human activity begins with a natural process slightly modified. The birds are in a sense the original basketmakers, and it is known that some very expert Indian tribes take the grasses and the stems of plants as they find them. They know nothing of drying or manipulating. Improvement grows out of study into the nature of substances, until with some tribes the obtaining of raw materials involves quite as much sagacity, toil, and travel as the making of the basket.

For procuring the roots, the apparatus of digging is neces-

sary. To be sure, the hand was the first hoe and the strong arm draws the root from its hiding-place, but our Indians had gotten beyond that. The northern Indians, especially those of the Columbia River in western Canada, use quite elaborate forms of this device. It is wonderful to think of the sagacity developed in savage minds by the quest for underground substances and the proper discrimination of the places where the best examples abound. From the farthest north, in the neighbourhood of Point Barrow, to the southern portions of South America, roots form substantial materials in basket-making, both twined and coiled. It is not enough to say simply that roots of plants were the materials of the baskets, but it is well known that the savage women knew in each section what plant furnished the toughest and most pliable roots, the localities in which this kind of root reached its best, the plants that yielded brown, red, and black coloured splints, which produced unrivalled effects, though the portion above ground gave no sign of the treasures held or the time of year when it was proper to obtain these substances, and the processes by which they could be extracted and saved most economically. Incidental to this quest of material, of course, was that of carrying, so that here in the very beginning of our art a host of useful human activities are engendered. The Klamath invented a peculiar kind of mud-shoe to wear when wading about in shallow marshes after roots for their industrial arts. (See fig. 1.)

The stems of plants, grass, rushes, and woody species are to be found in the basketry of almost every portion of the Western Hemisphere. The young and tough shoots of a single year's growth are choice materials for some purposes, and were eagerly sought. In those regions where spinous plants yielded the materials, a sort of gathering-knife was employed resembling a miniature sickle with a wooden handle. There is a time of year when they are in the best condition for the basket woman's craft. There are certain parts of the stems

which are useful in this direction, while others are valueless. In woody species the outer layer next to the bark has the toughness of leather, while a little way inward the wood is almost as brittle as glass. Furthermore, the stems of plants vary greatly in colour—different parts of the same stem vary much in this respect.

Now, the student would be surprised to find in the East, in the West, in the North, and in the South that there is very little more for the savage woman to learn. Distinguished botanists will say that instead of trying to teach the Indians the use of new plants, the best way to search for new materials to introduce into modern textile arts can be learned from these savage artisans. The leaves of plants are used in basketry, especially in the South. In the extreme North, among the Eskimo and Athapascan tribes, no leaves are suitable for basketry. Among the Aleutian Islanders, stems and leaves of grass come into play. Down the Pacific coast of the continent, in southeastern Alaska, British Columbia, and the coast States of the Union, leaves, either in their natural colours or dyed, are employed with great effect in many types of ornamentation, as will be seen further on. The range of usefulness, either for texture or ornament, is well known to the basketmaker. In Mexico and tropical America this division of the subject has been developed most. Little mechanism is necessary in this part of the world. A sharpened stick for the root-gatherer and a flint knife and mussel-shell for the stem-harvester complete the outfit. Nimble fingers aided with the teeth were the most useful apparatus.

In her textile gleaning, the savage woman has not been slow to avail herself of the metal appliances introduced by the whites. You will now see her afield with pick and knife of steel, gathering the old-time substances.

Preparing Materials

As is well known, every industry may be divided, either in savagery or in civilisation, into four parts: First, that which

is associated with taking the gifts of nature, called in this particular instance harvesting; second, the transformation of this material into proper form for special trades; third, the manufacture of useful and ornamental objects; and, finally, the activities of consumption and enjoyment, by which the things may take their places as servants to supply the wants and desires of mankind.

The preparation of materials for basketry consists in splitting and separating the desirable from the undesirable portions; in removing the bark; in taking the soft and spongy matter from the fibrous portion, like soaking and hackling in flax; in making ribbon-like splints of uniform width and thickness; in shredding, as in cedar bark; in twisting, twining, and braiding; in gauging, and colouring.

The apparatus for this intermediate work must have been in aboriginal times very simple, a stone knife and shell for scraping supplementing the work of the fingers and the teeth. The quality of the finished workmanship depends largely upon this secondary process. In those regions of very uniform moisture the plants used were of quick growth and pliable, and it would be easy, even without metal tools, to secure fine splints and other elements in the manufacture; but in those localities where the raw substances were more brittle, fine work would be difficult, and, indeed, was impossible until quite recently. It is a question, therefore, whether anciently some of the modern processes in basketry were known at all. Certainly there was no such delicate basketry made in Canada by the untaught aborigines as can now be procured from their descendants; but in the old graves of California and the adjoining areas wonderful pieces of delicate workmanship are brought from ancient pre-Columbian tombs.

It must not be forgotten that colouring matters were in ancient times among the prepared materials of basketry. Nature furnishes opportunities for diversity of colour in the substances themselves. The Indian also knew how to change

Plate 12. **See page 55**

POMO WOMAN WEAVING A TWINED BASKET, CALIFORNIA

Photograph by H. W. Henshaw

or modify the natural colour of different materials by burying them in mud. The juices of the plants and the mineral substances in the mud combined to produce darker shades of the same colour or an entirely different one. But the savage women had gone further, for they well knew that certain plants were useful as dyes. In point of fact, the best dyestuffs of each area had been exhaustively exploited. A list of these for each area would include a large number of useful plants. As in gathering materials the simplest processes involved slight artificiality, so in this intermediary art the most primitive basketmakers modified little their raw materials. They did not store them away for the convenient season, and, save that they soaked them before using, practiced none of the refining processes necessary to the highest results.

In each of the culture areas of America the methods of preparing materials were peculiar.

Dr. Walter J. Hoffman* described, in 1895, the aboriginal process of preparing material for wicker baskets among the Menomini Indians (Algonquian family) on Lake Michigan. See figs. 110 to 114 in this book.

A small log of wood, 3 or 4 inches in diameter and as long as it is possible to procure one without knots, furnishes the splints. (Hoffman's fig. 37.) These logs are cut when the rings of annual growth are most easily ruptured. The log is beaten with a wooden mallet. The example shown in Hoffman's illustration (fig. 38) is of modern type, made with steel tools, but the ancient Indian, no doubt, had a much rougher but quite as efficient implement. The strips thus loosened are torn off one by one as long as the material is sufficiently flexible for basket-making. The next process is the shaping of these splints for the desired work—splitting them, shaving them down thin and smooth, and finishing them for the hand of the weaver.

* Fourteenth Annual Report of the Bureau of Ethnology, Part I, Figs, 37-41.

The basketmaker's awl of bone, the old aboriginal implement, may be seen at work in many camps; but the knife with which the pre-Columbian woman cut her basket material has utterly disappeared from use. Now, among the Algonkin, the knife of steel has vastly improved their art, and it raises a question whether in the pristine condition of savagery some forms of basketry were as good as they are at present. This query applies only to work done in hard wood.

The knife now in use among the Indians for this and other wood-working purposes is an interesting survival from the remote past in Europe. It is now active in the farrier's shop for paring the frog of the horse's foot prior to putting on the shoe; but two or three centuries ago, under the name of man's knife,* it found its way through the entire English and French area of North America.

A curved blade of steel is inserted or laid in a groove on the side of the handle, made fast by wrapping with strong twine. The groove is shouldered so as to take the pressure. The blade is detachable for the purpose of grinding it. It will be seen that if held in the right hand the operator cuts toward himself. This is the ancient method of whittling practiced by the peoples on the western shores of the Pacific Ocean, the Ainos, Japanese, etc. (Hoffman's fig. 39.)

A bundle of splints is shown in fig. 40 of Hoffman's paper of different widths ready for the hand of the basketmaker, and in fig. 41 (Hoffman) is a coarse-finished product showing the method of setting up the warp and applying the weft in wicker basketry of the Menomini.

It is not known that the ancient Menomini used any dyes whatever on their baskets. In their modern ware they procure these substances through traders.

The sweet grass (*Savastana odorata*), of which large quan-

* The Man's Knife among the North American Indians: A study in the Collections of the U. S. National Museum, by Otis Tufton Mason, Report of the U. S. National Museum, 1897, pp. 725–745, 17 figs.

Plate 13. See page 55

TLINKIT WOMAN WEAVING A TWINED WALLET, SOUTHEASTERN ALASKA

Photograph from G. T. Emmons

tities of baskets are manufactured, was dried in the shade to hold its colour. Further, it was rolled into bunches and sewed with sinew, as the Eskimo do in making their coiled baskets. Very old specimens of such ware are preserved in collections. But in the ware now in the market, twine and braid of this material are prepared beforehand in large quantities for the future use of the weaver and frequently by different hands.

Farther south in the Eastern basket area the canes for twilled basketry needed no knife for the splitting. A slight blow would crush the stalk, the spongy matter adhering to the inside was scraped away, and the splints were ready for the dyer or the weaver, if they were not to be coloured.

The following information concerning natural sources of colour for basketry and other objects among the Cherokee Indians comes from Miss Harriet C. Wilkie, of Raleigh, North Carolina. The petals of the iris rubbed on a slightly rough surface are said to yield a rich and lasting purple. The blossoms and tender green tops and leaves of the common sneeze weed (*Helenium autumnale*) made into a tea yield a beautiful and fadeless yellow. Long boiling dulls this to a yellowish olive. The common broom-sedge (*Andropogon scoparius*), winter dried, yields another yellow, less pure and brilliant, also much affected by continued boiling. The colour is known as burnt orange and works beautifully in basketry.

In central Alaska the Athapascan tribes use both spruce and willow for their coiled basket jars and trinket material. Much care is bestowed in splitting the roots and stems in order to procure uniform sewing-material. In the U. S. National Museum the specimens all show care in this regard. The Alaskan Eskimo on Bering Sea also manufacture coiled basketry as well as twined, but it is from dried grass, and shows very little care in the preparation. Crossing over to the Aleutian chain, the care bestowed on materials is different.

When Attu weavers want the grass to be white, it is cut in November, the whole stalk (wild rye), and hung points down

out of doors to dry. If grass is to be yellow, the common colour, it is cut in the middle of July, and the two youngest blades that are full-grown are then taken out and split into three pieces, the middle one being thrown away. The other pieces are then tied in bunches about two inches in diameter and hung up to dry out of doors (points down). If the grass is to be cured green it is prepared as when it is wanted to be yellow, but the first two weeks of the curing is carried on in the shade of the dense growth of grass and weeds that is found in the villages. After that it is taken out and dried in the house. Under no circumstances is the sun allowed to shine on any of the grass in the process of curing, which takes about a month or more.

Beautiful coiled basketry is made by the Chilcotin, Harrison Lake, Lower Thompson Indians in British Columbia, Salish on the coast, as well as Klikitat and Tulalip in Washington. Only women and girls occupy themselves with this work. The baskets are made from the small, trailing roots of the cedar (*Thuja plicata*). These are dug up with an ordinary root-digger, and pieces of the desired length and of about the thickness of a finger are cut off. These are buried in the ground to keep them fresh. When required, they are taken out and peeled or scraped with a sharp stone or knife. They are then hung up until dry enough for use. Next they are split into long strips by inserting and pressing forward the point of the awl used in basket-making, made from the long bone of a deer. The pieces which have the desired width and thickness throughout their entire length are used for stitching purposes, while others which split irregularly, or are too short or too thin to be used for that purpose, are put together in bundles to form the foundation of the coils. In the sewing, these foundations are kept continuous and of uniform thickness by adding fresh pieces as required. (See Plate 11.)

In other basketry, thin, pliable strips of cedar, sap or

other wood, in pairs, having both smooth sides out, are used for foundation instead of the bunches of split roots. These are stitched in the same manner, but are neither so strong nor so durable, nor are they water-tight.*

The Upper Fraser and the Lytton bands sometimes use *Elymus triticoides* instead of *Xerophyllum*. The bark used is that of *Prunus demissa*, which is either left its natural light reddish-brown colour or is dyed by burying it in damp earth. By thus keeping it under ground for a short time it assumes a dark-brown colour; if kept longer it becomes quite black. (Teit.)

The Makah Indians make a red colour by mixing vermilion with chewed salmon eggs; black colour is a combination of bituminous coal and the same carrier; cedar bark is coloured black by soaking in mud, and red by means of alder bark, chewed. (Swan.)

The Twana Indians, on Skokomish Reservation, Washington, now use a steel-bladed knife and an awl of the same material in basket-making. Formerly they employed a pointed stick or bone for their imbricated ware and for pressing home the weft of twined basketry; but in large measure their fingers are their tools. (Myron Eells.) The same remark applies to basketmakers in all the culture areas. Fingers and teeth are still in vogue and can not be dispensed with. The metal awl, however, quite displaces that of bone, and it is not surprising to find scissors of the best make added to the steel-bladed knife, especially for clipping off the projecting ends of materials.

Hazel stalks are gathered by Oregon tribes in best form on ground that has been burned over, the young ones springing up straight and strong from the rich soil. The peeled stems are used without splitting, and generally without dyeing: now and then a few are stained in mud and charcoal (See Plate 172).

* James Teit, The Thompson Indians of British Columbia, Memoirs of the American Museum of Natural History, II, Pt. 4, 1900, pp. 163–392.

(Mrs. Harriet K. McArthur.) The fine white grass, like ivory in smoothness and tint, in fine Shasta and Rogue River baskets, is obtained at great elevations, their excursions leading them to the summer snow-line of Mount Shasta.

Processes of Manufacture

As you gaze on the Indian basketmaker at work, herself frequently unkempt, her garments the coarsest, her house and surroundings suggestive of anything but beauty, you are amazed. You look about you, as in a cabinet shop or atelier, for models, drawings, patterns, pretty bits of colour effect. There are none. Her patterns are in her soul, in her memory and imagination, in the mountains, watercourses, lakes, and forests, and in those tribal tales and myths which dominate the actions of every hour. She hears suggestions from another world. Her tools are more disappointing still, for of these there are few—a rude knife, a pointed bone, that is all. Her modelling-block is herself. Her plastic body is the repository of forms. Over her knee she moulds depressions in her ware, and her lap is equal to all emergencies for convex effects. She herself is the creator of forms in her art.

The Tlinkit in weaving, says Emmons, sits with the knees drawn up to the chin, the feet close to the body, the shoulders bent over, the arms around the knees, the hands in front. Sometimes one knee is dropped a little to the side, and, in the case of old women, they often recline on one hip, with the legs drawn up, the elbows resting on a pillow or blanket doubled up.

In all types of weave the working strands are constantly dampened by dipping the fingers into a basket or cup of water close at hand, or, in the case of embroidery, by drawing the section of grass stem through the lips. The material is kept in a plaque-like workbasket called tarlth ("spread out," from its flat bottom and low, flaring sides). Besides the shell or metal knife there is generally a rude awl, consisting of a spike of goat or deer horn, a bear's claw, or a piece of bone

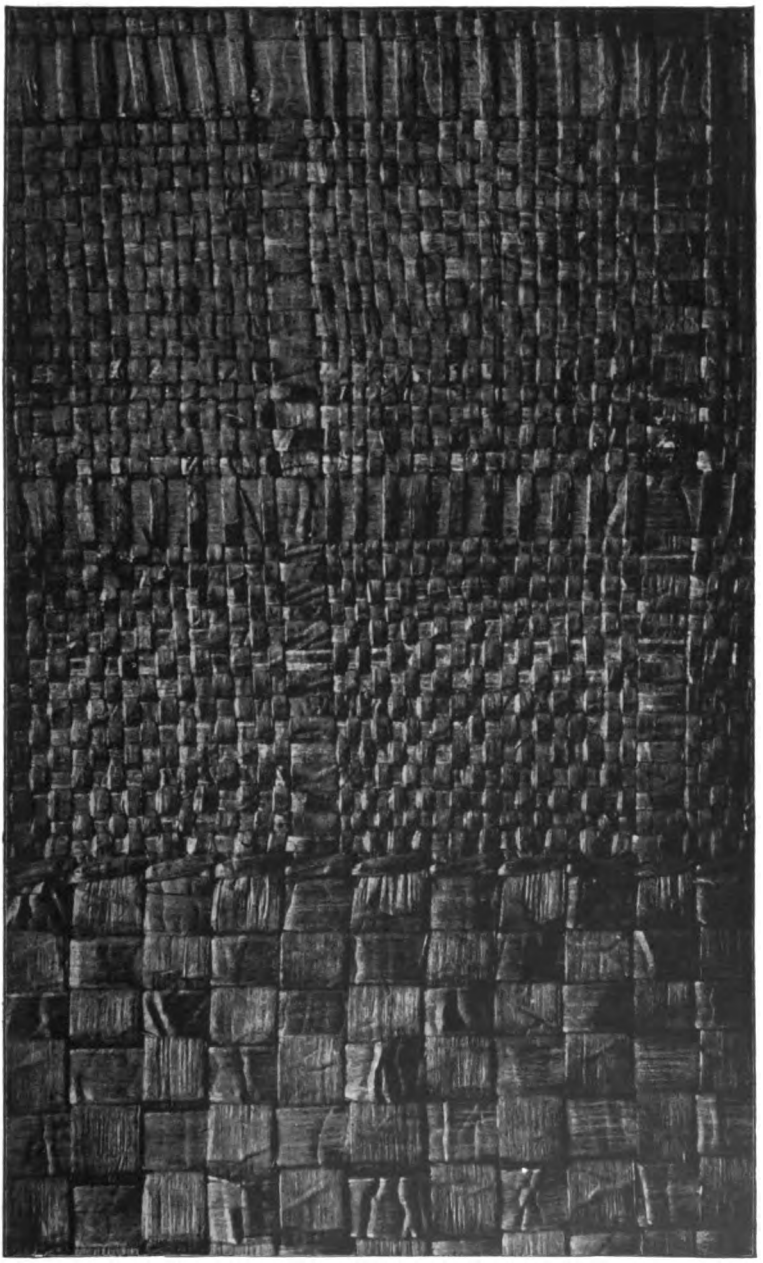


Plate 14. See page 58

CHECKERWORK IN CEDAR BARK, SHOWING VARIETY OF EFFECTS

Collections of U. S. National Museum

rubbed down to a tapering point, and a large incisor of the brown bear or the tooth of the killer whale. These constitute all of the tools and accessories used in basketry. I am indebted to Lieutenant Emmons for this information.

Plate 12 represents a Pomo Indian basketmaker. In front of her is an unfinished water-tight basket jar in plain twined weaving. The warp elements are willow rods dressed down to uniform thickness; the weft is of carex root and ceris stems split, the patterns being made in the latter. (Photographed by H. W. Henshaw.)

Plate 13 represents a Tlinkit woman of Sitka, Alaska, making a twined basket. All the native surroundings are absent—the environment, as men are wont to say—but the artist's mind and skilful fingers remain. She has four elements to handle simultaneously—warp, two wefts, and decorative material. The mouth, therefore, is brought into requisition, as may be seen. The operation consists in twining with finely divided spruceroot and wrapping each outside splint with coloured straw. The work resembles embroidery when finished, and is, in this work, called false embroidery.

There seems to be always an affectionate fellow-feeling between the skilful hand of the artisan and the materials which it fashions. The more tractable the latter, the more deft the former. That is not always true in culture. The best endowment does not always yield the best results. But the statement holds good in our art with few exceptions. Where the finest grasses grow, and the toughest roots and stems, they set up a school of mutual refinement between the woman and her work. It needs only a few miles eastward or northward to change the garden into a desert and correspondingly to degenerate the artist. It would be unjust to her ingenious mind to overlook the fact that she has been utterly cast down by the failure of one kind of material. She is not long in finding out new substances and new technic processes for each environment.

WOVEN BASKETRY

The various processes of manufacture will now be definitely explained. In technic, as already said (page 6), basketry is either hand-woven or sewed. The hand-woven basketry is further divisible into (A) *Checkerwork*, (B) *Twilled work*, (C) *Wickerwork*, (D) *Wrapped work*, and (E) *Twined work*, in several varieties. The sewed work goes by the name of coiled basketry, and is classed both by the foundation and the fastening. In addition to these technical methods on the body, special ones are to be found in the border.

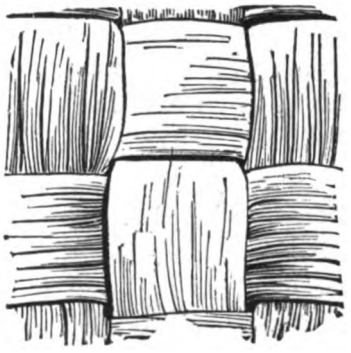


FIG. 2.
COARSE CHECKERWORK.

A. *Checkerwork.*—This occurs especially in the bottoms of many North Pacific coast examples, and also in the work of eastern Canadian tribes (fig. 2); in matting its use is well nigh universal.

In this ware the warp and the weft have the same thickness and pliability. It is impossible, therefore, in looking at the bottoms of the cedar-bark baskets and the matting of British Columbia (fig. 3) or Eastern Canada, to tell which is warp and which is weft. In very many examples the warp and weft of a checker bottom are turned up at right

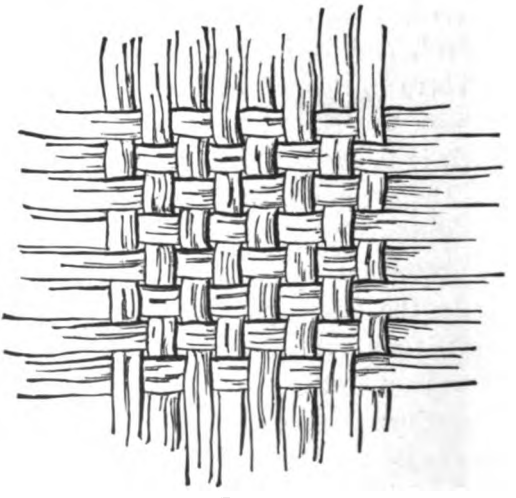


FIG. 3.
FINE CHECKERWORK.

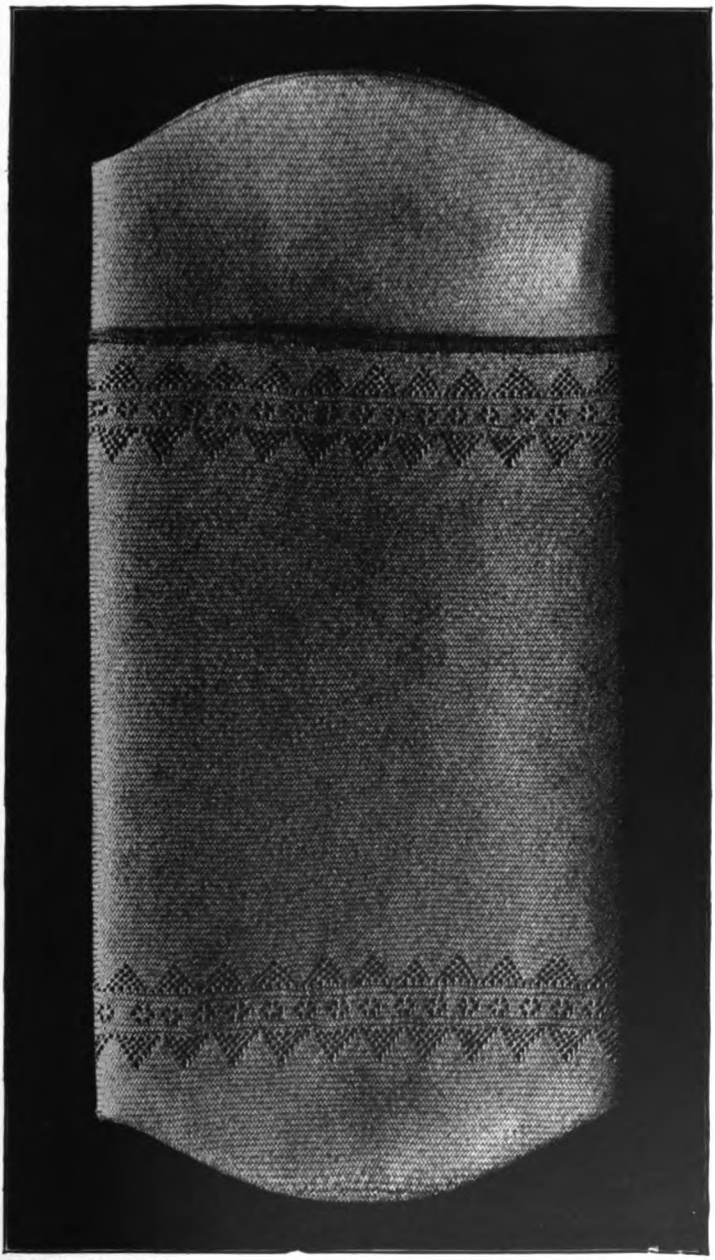


Plate 15. See page 58

CIGAR CASE IN FINE TWILLED WEAVING, FROM ECUADOR

Collection of Robert Fletcher

angles to form the warp of the sides, which may be wicker or twined work. A great deal of bark matting is made in this same checkerwork, but the patterns run obliquely to the axis of the fabric, giving the appearance of diagonal weaving. The fine hats of Ecuador are especially noticeable in this deceptive appearance, which is caused by the weaver's beginning the work at the center. Perhaps, though there is no positive information on this subject, the North Pacific coast women proceed in the same manner to give a tiled effect to the surface of their matting. When warp and weft are fine yarn or threads the result is the simplest form of cloth in cotton, linen, piña fiber, or wool. The cheap fabrics of commerce are of this species of weaving. In art

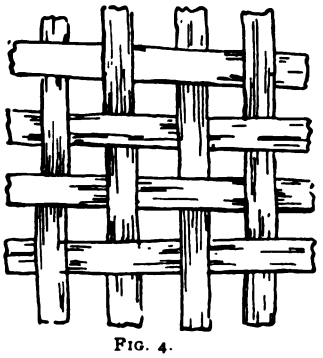


FIG. 4.
OPEN CHECKERWORK.

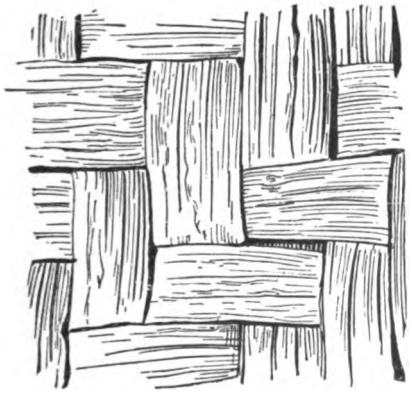


FIG. 5.
TWILLED WORK.

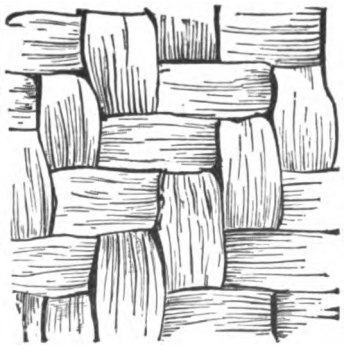


FIG. 6.
TWILLED WORK.

and industry latticework frequently shows the bars intertwined as in checker basketry (fig. 4).

From this results a most stable figure, the elasticity of

the material and the friction of the surfaces holding the fabric together. (See figs. 4, 5, 6.)

The pleasing effects that may be produced in checker are shown in Plate 14. At the bottom is coarse work. At the end of seven rows the warp strips of bark are held firmly in place by a row of twined weaving and then split into four, each sixth one being left whole for artificial effects. At proper intervals broader strips of weft are introduced. In the chapter on ornamentation attention will be called to the variety in this mass of unity by the individual characteristics of each square in the weaving.

B. *Twilled work.*—This is seen especially in those parts of the world where cane abounds. In America it is quite common in British Columbia, Washington, southern United States, Mexico, and Central America, and of excellent workmanship in Peru, Guiana, and Ecuador. The fundamental technic of diagonal basketry is in passing each element of the weft over two or more warp elements, thus producing either diagonal or twilled, or, in the best samples, an endless variety of diaper patterns. (See figs. 5 and 6.)

The example shown in Plate 15 represents a cigar-case made by the women of Ecuador, who weave the celebrated Panama hats, the texture being fine twilled work. The ornamentation should be studied carefully, for it consists of twined weaving, in which both warp and weft strands are brought together in pairs and one twined about the other. There is no attempt at anything but plain over-two weaving elsewhere in this specimen. To the student of technology it is charming to read in this connection from Ure's Dictionary* the laboured description of twilled loom-work with its hundreds of parts in the climax of a series of inventions initiated with savage women's fingers.

Twill, or *tweel.* A diagonal appearance given to a fabric by causing the weft threads to pass over one warp thread, and

* Article Weaving, fourth edition, London, 1853.

then under two, and so on, instead of taking the warp threads in regular succession, one down, one up. The next weft thread takes a set oblique to the former, throwing up one of the two deposed by the preceding. In some twills it is one in three, or

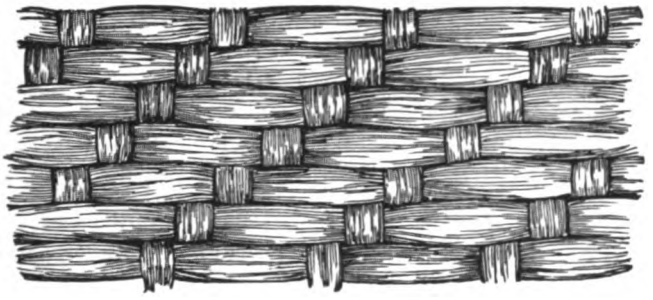


FIG. 7.
ANCIENT TWILLED WORK.
Pressed on pottery of Alabama. After W. H. Holmes.

one in four. The Latin *trilix*, a certain pattern in weaving, became *drillich* in German, and hence our word *drill*. *Twill* is derived from *zwillich*, which answers to the Latin *bilix*, and

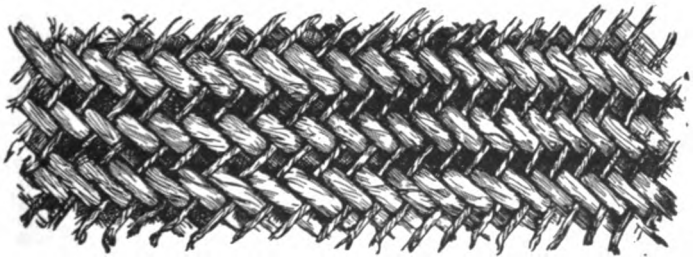


FIG. 8.
ANCIENT TWILLED WORK.
Pressed on pottery of Tennessee. After W. H. Holmes.

the Greek *dimitos*. The latter survives in *dimity*. See also *samite*, derived from Greek *hexamiton*, six-thread.

The French *touaille* has also been suggested as the etymological source of the word.

The fabrics thus woven are very numerous—satin, blanket, merino, bombazine, kerseymere, etc. When the threads cross

Plate 16. See page 60

TRAY, OLLA RING, AND PEACH BASKET

These baskets are quickly twilled from Yucca leaves and bear the brunt of domestic use. On the trays, peaches, hominy, etc., are dried, or the family meal is served. Peaches are carried from the orchards in the deeper basket, or it may contain odds and ends of food about the house. The water vases are protected from knocks on the stone floor by the wicker ring.

Collected by V. Mindeleff and W. Hough

utilised wide fiber of bast or split cane for the warp, and string for the weft, passing in their work over two each time. For the uses of woven fabrics on making pottery, and the interesting way in which the history of lost arts have been preserved, see Chapter VII.

Excellent variety was also produced in this kind of weaving by means of colour. Almost any textile plant when split has

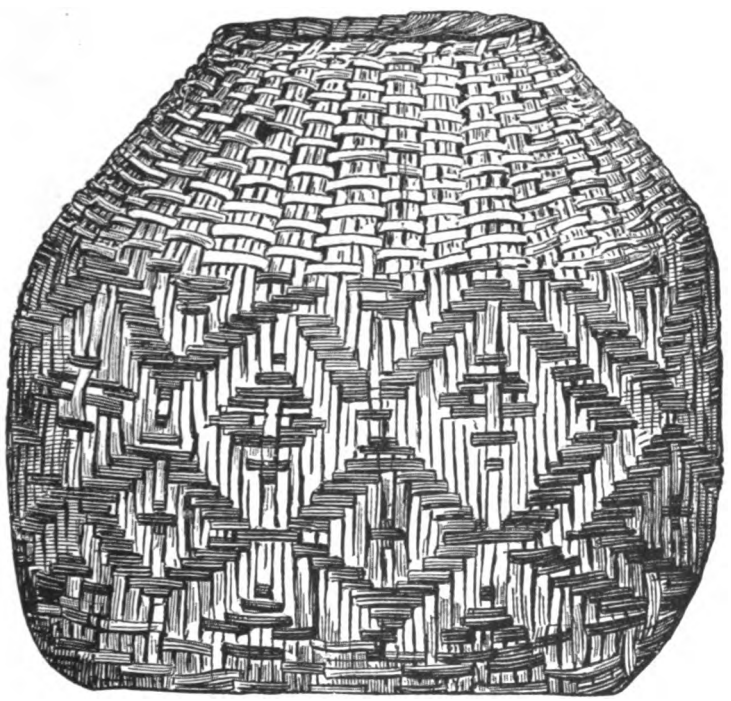


FIG. 9.
TWILLED WEAVING.
Cherokee Indians, North Carolina.

two colours, that of the outer, or bark surface, and that of the interior woody surface or pith. Also the different plants used in diagonal basketry have great variety of colour. By the skilful manipulation of the two sides of a splint, by using plants of different species, or with dyed elements, geometric patterns, frets, labyrinths, and other designs in straight line are possible. (See fig. 9.)

Examples from the saltpeter caves, and modern pieces from the Cherokee, both in matting and basketry, are double. By this means both the inside and the outside of the texture expose the glossy silicious surface of the cane. By changing the number of warp splints or a stem over which the weft

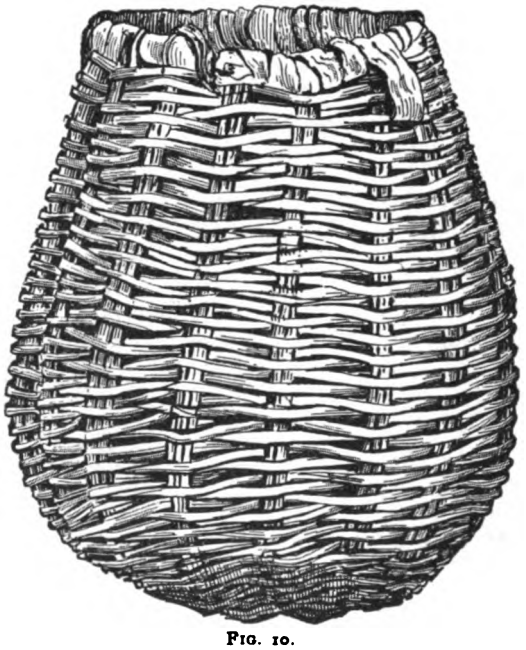


FIG. 10.
WICKER BASKET.
Zuñi, New Mexico.
Cat. No. 40291, U.S.N.M. Collected by J. W. Powell.

passes, it will be seen in the figure here given that great variety of diaper or damask effect may be produced.

C. *Wickerwork.*—The name is from the Anglo-Saxon *wican*, to bend. Common in eastern Canada, it is little known on the Pacific coast and in the Interior Basin, excepting in one or two pueblos, but is seen abundantly in southern Mexico and Central America. It consists of a wide or a thick and inflexible warp and a slender, flexible weft (fig. 10). The weaving is plain, and differs from checkerwork only in the fact that one of

the elements is rigid. The effect on the surface is a series of ridges. It is possible also to produce diagonal effects in this type of weaving.

Wickerwork must have been a very early and primitive form of textile. Weirs for stopping fish are made of brush, and wattled fences for game-drivers are set up in the same manner. A great deal of the coarse basketry in use for packing and transporting is made in this fashion. The Zuñi Indians make gathering-baskets of little twigs after the same technic, the inflexible warp being made up of a small number of twigs of the same plant laid side by side. The transition from checker to wicker in some examples is easy. The moment one element, either warp or weft, is a little more rigid than the other, the intersections would naturally assume a wicker form.

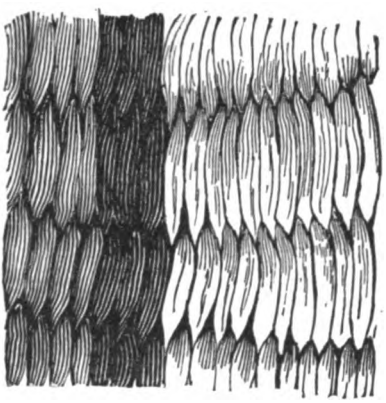


FIG. 11.
CLOSE WICKERWORK.
Hopi Indians, Arizona.

The finest specimens in America are the very pretty Hopi plaques made of *Chrysothamnus moquianus* and *C. laricinus*. Short stems are dyed in various colours for weft, the ends worked into the warp, and the whole driven tightly home, so as to hide the ends of the warp and even the manner of weaving. (See fig. 11.)

Various patterns are effected on the surface—geometric figures, clouds, mythical animals and persons, and symbols connected with worship. Wickerwork has pleasing effects combined with diagonal and other work. Fig. 12 is a square Hopi plaque, having twilled weaving in the middle and a band of wicker outside of this, the whole finished with rough, coiled sewing on the border.

It has passed into modern industry through the cultivation of osiers, rattan, and such plants for market-baskets, covers for glass bottles, and in ribbed cloth, wherein a flexible weft is worked on a rigid warp. Also, good examples are now pro-

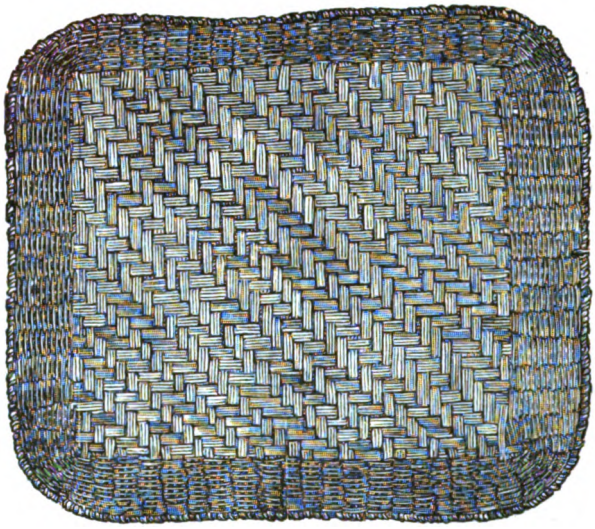


FIG. 12.
TWILLED AND WICKER MAT.
Hopi Indians, Arizona.
After W. H. Holmes.

duced by the Algonkin tribes of New England and eastern Canada.

For commercial purposes, wicker baskets precisely like those of the Abenaki Indians are thus made.

The white-oak timber is brought to the yard in sticks running from 6 to 40 inches in diameter and from 4 to 18 feet long. It is first sawed into convenient lengths, then split with a maul and wedges into fourths or sixteenths. The bark is then stripped off with a drawing-knife. The next process is cutting it into bolts at what is called the splitting-horse, to be shaved down with a drawing-knife into perfectly smooth, even bolts of the width and length desired. These are then placed in the steam-box and steamed for a half-hour or so, which makes

Plate 17. See page 67

MOHAVE CARRYING BASKET, IN WRAPPED WEAVING,
LOWER COLORADO RIVER

Collection of Field Columbian Museum

the splints more pliable. They are taken thence to the splint knife, which is arranged so that one person, by changing the position of the knife, can make splints of any desired thickness, from that of paper to that of a three-fourths-inch hoop.

The oyster-baskets and most small baskets have the bottom splints laid one across another and are plainly woven in checker.

But the round-bottomed baskets, used for grain and truck, are made by taking from ten to eighteen ribs and laying them across each other at the middle, in radiating form, and weaving around with a narrow thin splint until the desired size for the bottom is reached, when the splints are turned up and set in other baskets, about a dozen in a series, for twenty-four hours.

They are then woven around with a fine splint and placed on a revolving drum or form and filled up the required height and set in the sun to dry for six hours. They are then shaken hard by striking the bottom on the floor, which causes the splints to settle tightly together, prepared for the rim. They next proceed to fasten the handles to the sides and put the rims or hoops on by fitting them into the notches made in the handles, and binding them tightly with fine splints. Styles are made by using different-shaped drums and variously coloured splints, the latter being made by dipping the splints before weaving into dyes.

The most curiously made baskets are those for charcoal and eelpots.

The charcoal-baskets are shaped like a tray and are carried on the head by the coal-carriers.

The eelpots are used as traps for catching eels. The wood is prepared for them in the same manner, and they are made on a form about forty inches long and in the shape of a bottle without the bottom, and have a funnel arrangement at either end, which is detachable.

D. *Wrapped work.*—Wrapped basketry consists of flexible or rigid warp and flexible weft. Examples of this technic are

to be seen in America at the present time among the Indians of southern Arizona for their carrying-frames. (See fig. 13.)

The warp extends from the rigid hoop, which forms the top, to the bottom, where the elements are made fast. Firmness is given to the structure by means of two bowed rods crossing at right angles at the bottom and securely lashed at the top. The weft, usually of twine, is attached to one of the corner or frame pieces at the bottom and is wrapped once around each warp element. This process continues in a coil until the top of the basket is reached. In some of its features this method resembles coiled work, but as a regular warp is employed and no needle is used in the coiling it belongs more to the woven series. In the Merriam collection are shallow trays of coiled work in which the spiral foundation is held in place by means of radiating strings wrapped thus. On the wrong side a cord runs under the stitches. Hudson mentions the same among the Pomos for holding roof-poles in place. The wrapping is very close where the rafters come to a point. As they widen, the weft comes to be farther apart, being quite open on the outer margin. This method of weaving was employed by the ancient Peruvians and by the Mound Builders

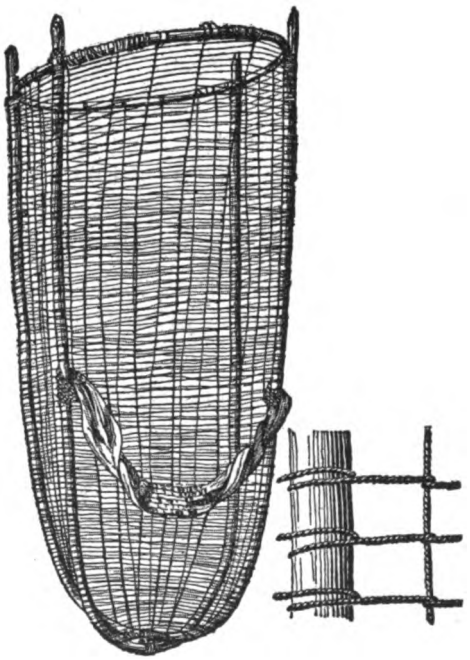


FIG. 13.
WRAPPED WEAVING.
Mohave Indians, Arizona.
Cat. No. 24145, U.S.N.M. Collected by Edward Palmer.

Plate 18. **See page 68**

ALEUT WOMEN WEAVING GRASS WALLETS IN TWINED WORK

Compare Figs. 147, 148

Photographed by C. Gadsden Porcher

of the Mississippi Valley. Markings of wrapped weaving pressed on ancient pottery taken from a mound in Ohio are to be seen in the Third Report of the Bureau of Ethnology. (See fig. 14.)

This style of weaving had not a wide distribution in America and is used at the present day in a restricted region. When the warp and the weft are of the same twine or material and the decussations are drawn tight, the joint resembles the first half of a square knot. The Mincopies of the Andaman Islands construct a carrying-basket in the same technic. Specimens of their work were collected and presented to the United States National Museum by Dr. W. L. Abbott.* These baskets resemble most closely the Mohave specimens, only they are smaller and more attractive. The Mincopies and their neighbours far and near have the incomparable rattan for warp and weft, which combines the strength and flexibility of copper wire. The distribution of this wrapped weaving has not been studied. Plate 17 is a carrying-basket in wrapped weaving from the Mohave Indians, photographed from the original now in the Field Columbian Museum, Chicago.

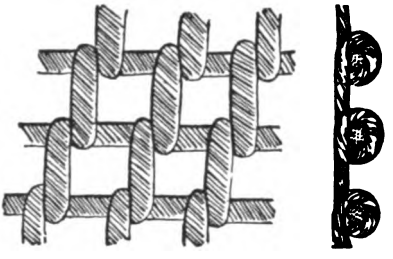


FIG. 14.
WRAPPED WEAVING, FROM MOUND IN OHIO.
After W. H. Holmes.

E. *Twined work.*—This is found in ancient mounds of the Mississippi Valley, in bagging of the Rocky Mountains, down the Pacific Coast from the island of Attu, the most westerly of the Aleutian chain, to the borders of Chile, and here and there on the Atlantic slope of South America. Indeed, it is found among savages throughout the world. It is the most elegant and intricate of all in the woven or plicated series. Twined work has a set of warp rods or rigid elements as in wickerwork,

* Smithsonian Report, 1901, pp. 475–492, pl. II.

but the weft elements are commonly administered in pairs, though in three-strand twining and in braid twining three weft elements are employed. In passing from warp to warp these elements are twisted in half-turns on each other so as to form a two-strand or three-strand twine or braid, and usually so deftly as to keep the smooth, glossy side of the weft outward.

The position of the weaver at her task on twinedwork, in Plate 18, shows the transition between the humble posture of the primitive basketmaker and her successor later on seated at a loom. The name of the weaver in the lower figure is Elizabeth Propokoffono. Her home is on the island of Atka, far out in the Aleutian chain. The Tlinkit weaver sits on the ground in the old-fashioned way, because her warp is rigid and self-supporting; Elizabeth, however, is working in soft grass, both for warp and weft. For this reason the former is suspended, and she is working from below upward. The Haida Indians on Queen Charlotte Archipelago south of her, as will be seen later on, weave in the same manner, the warp resting on a disk fastened to the top of a stake. Enough of modern technical appliances are mingled with this thoroughly aboriginal process to mark a sharp contrast between the woman's fingers and her beautiful basket on the one hand, and her loom-woven clothing, her flatiron, and the iron hinges on her door on the other hand.

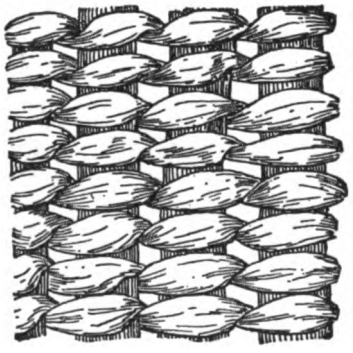


FIG. 15.
PLAIN TWINED WEAVING.

The upper figure shows a woman from Attu Island, also weaving a grass wallet in twined work, in front of her underground home or barabara. It is most interesting to observe that her warp is supported from a stick in the top of the house, and is mounted precisely as one shown in Plate 1, of Holmes's

Prehistoric Textile Art, taken from Hariot,* and illustrating industries of the eastern Indians at the period of discovery.

According to the relation of the weft elements to one another and to the warp, different structures in twined weaving result as follows:

1. Plain twined weaving over single warps.

2. Diagonal twined weaving, or twill, over two or more warps.

3. Wrapped twined weaving, or bird-cage twine, in which one weft element remains rigid and the other is wrapped about the crossings.

4. Lattice-twined, tee or Hudson stitch, twined work around vertical warps crossed by horizontal warp element.

5. Three-strand twined weaving and braiding in several styles.

1. *Plain twined weaving.*—Plain twined weaving is a refined sort of wattling or crating. The ancient engineers, who built obstructions in streams to aid in catching or impounding fish, drove a row of sticks into the bottom of the stream, a few inches apart. Vines and brush were woven upon these upright sticks which served for a warp. In passing each stake, the two vines or pieces of brush made a half-turn on each other. This is a very primitive mode of weaving. Plain twined basketry is made on exactly the same plan. There is a set of warp elements which may be reeds, or splints, or string, arranged radially on the bottom and parallel on the body. The weft consists of two strips of root or other flexible material, and these are twisted as in forming a two-strand rope passing over a warp stem at each half-turn. (See fig. 15.) Many waste-baskets are woven on this plan.

Plate 19 shows two bowls in plain twined weaving, called Bamtush by the Pomos, which are excellent examples of the possibilities and limitations of this style. They are in the collection of C. P. Wilcomb, of San Francisco. The upper figure,

* Thirteenth Annual Report of the Bureau of Ethnology, 1896, Plate 1.

10 inches in diameter, is from Cloverdale, Russian River, Sonoma County; the lower from Potter Valley, in Mendocino County. The warp is of willow rods, the weft of carex root and splints of cercis. A small space at the bottom is in three-ply braid, and the narrow band near the top, with wide twists, is plain twined work over more than one warp stem. (See Plates 34, 44, 71, 72.)

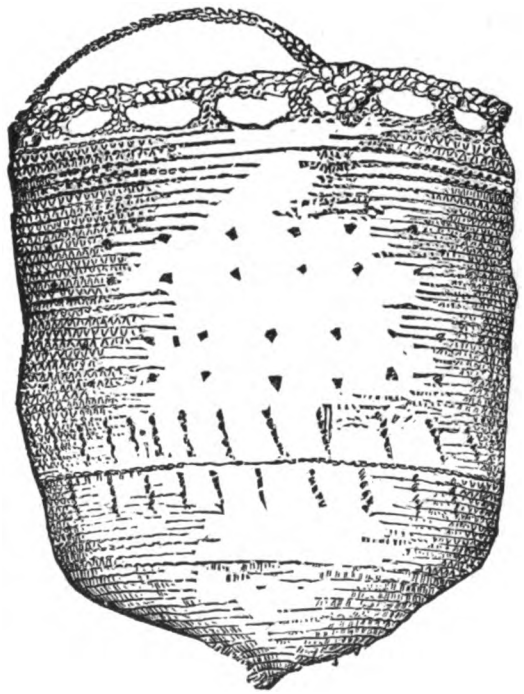


FIG. 16.
OPENWORK TWINED WALLET.
Aleutian Islands.
Cat. No. 14978, U.S.N.M. Collected by W. H. Dall.

In this connection must not be overlooked a variety of twined weaving in which the warp plays an important part. It is a transition between the plain twine and the next type, the halves of the double warp standing for the independent warp stems of the diagonal weave. If the weft be administered in openwork with the rows from a fourth to a half an inch apart, and the warp elements be flexible under the strain of weaving, they will assume a zigzag shape.

Pleasing varieties of this type of twined weaving will be found in the Aleutian Islands. (See fig. 16.) It resembles hemstitching. The Aleuts frequently use for their warp stems of wild rye or other grasses, in which the straws are split, or a pair used, and the two halves pass upward in zigzag form.

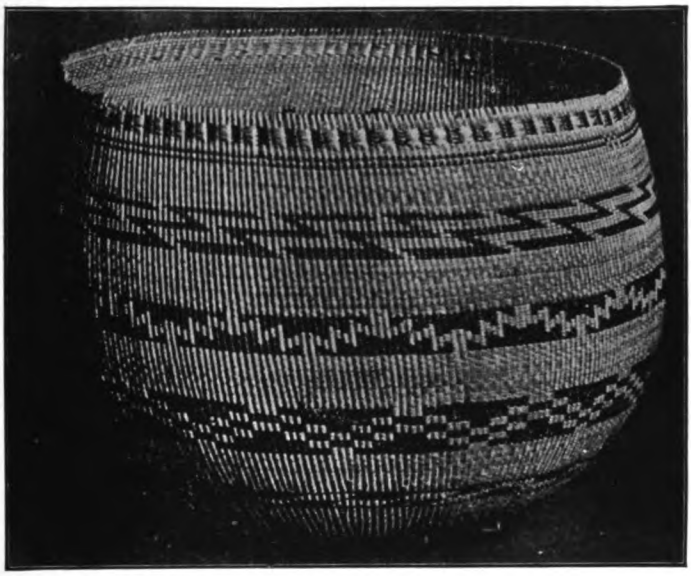


Plate 19. See page 69

BASKETS IN PLAIN TWINED WEAVING, SHOWING INSIDE AND OUTSIDE EFFECTS, POMO INDIANS, CALIFORNIA

Collection of C. P. Wilcomb

Each half of a warp is caught alternately with the other half of the same straw and with half of the adjoining straw, making a series of triangular instead of rectangular spaces. (See fig. 17.)

A still further variation is given to plain twined ware by crossing the warps. In the bamboo basketry of eastern Asia these crossed warps are also interlaced or held together by a horizontal strip of bamboo passing in and out in ordinary weaving. In such examples the interstices are triangular, but in the twined example here described the weaving passes across between the points where the warps intersect each other,

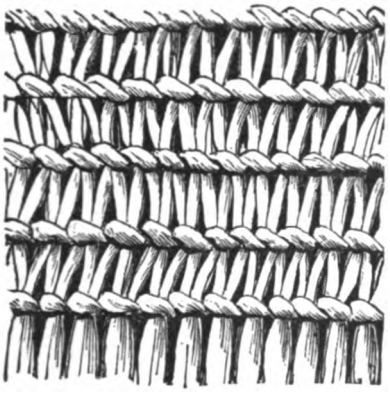


FIG. 17.
TWINED OPENWORK.
Aleutian Islands. (Enlarged.)

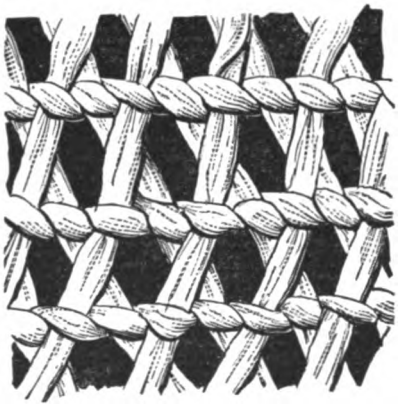


FIG. 18.
CROSSED WARP, TWINED WEAVE.
Makah Indians, Washington.

leaving hexagonal interstices. (See fig. 18 and Plate 166.) This combination of plain twined weft and crossed warp has not a wide distribution in America, but examples are to be seen in southeastern Alaska and among relics found in Peruvian graves.

2. *Diagonal twined weaving.*—In diagonal twined weaving the twisting of the weft filaments is precisely the same as in plain twined weaving. The difference of the texture is caused by the manner in which the weft crosses the warps. This style abounds among the Ute Indians and the Apache, who dip the bottles made in this fashion into pitch and thus produce a

water-tight vessel, the open meshes receiving the pitch more freely. The technic of the diagonal weaving consists in passing over two or more warp elements at each turn, just as in weaving with a single element. But the warp of the diagonal twined weaving never passes over or under more than one weft as it does in twilled weaving. There must be an odd number of warps, for in the next round the same pairs are not included in the half-turns. The ridges on the outside, therefore, are not vertical as in plain weaving, but pass diagonally over the surface, whence the name. (See Plate 20 and figs. 19 and 20.)

FIG. 19
DIAGONAL TWINED WEAVING.
Ute Indians, Utah.

Plate 20 will make clear the difference between plain twined weaving and diagonal twined or twilled work. The figures are of the burden basket, the granary, and the mush bowls of the Pomo Indians, in Lake, Sonoma, and Mendocino counties, California, in the collection of C. P. Wilcomb. Especial attention is here drawn to the infinitely greater possibilities of decoration in the twilled work. The foregoing plate shows that the ornamentation of plain twined basketry is confined chiefly to bands, but here the artist revels in the cycloid, which widens and becomes more intricate as it ascends. It rivals in complexity the best coiled work of the Pomos, and should be compared with Plates 29 and 56.

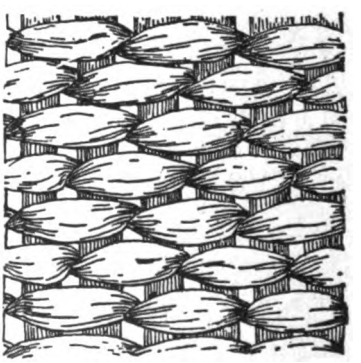


FIG. 20.
DIAGONAL TWINED BASKETRY.
Pomo Indians, California.
Collection of C. P. Wilcomb.

3. *Wrapped twined weaving.*—In wrapped twined weaving

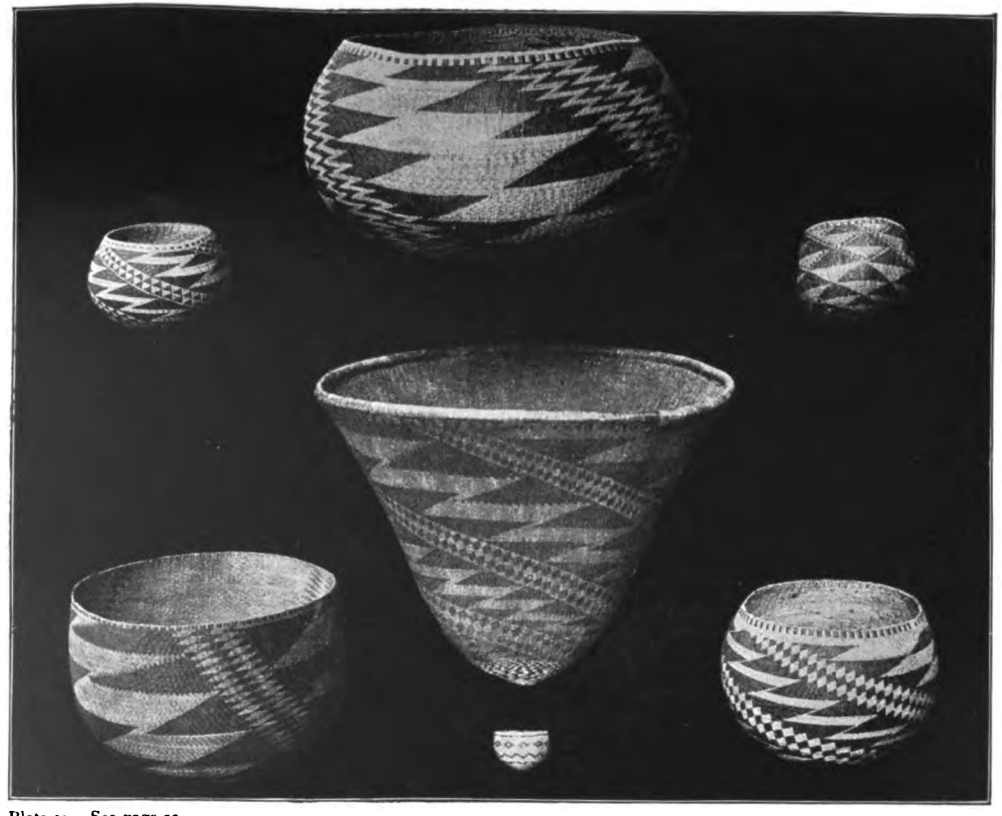


Plate 20. See page 72

BASKETS IN TWILLED TWINE WEAVING, SHOWING IMPROVED CAPABILITIES FOR ORNAMENT, POMO INDIANS, CALIFORNIA

Collection of C. P. Wilcomb

one element of the twine passes along horizontally across the the warp stems, usually on the inside of the basket, forming a lattice. The binding element of splint, or strip of bark, or string, is wrapped around the crossings of the horizontal element with the vertical warp. (See fig. 21.)

On the outside of the basket the turns of the wrapping are oblique; on the inside they are vertical. It will be seen on examining this figure that one row inclines to the right, the one above it to the left, and so on alternately. This was occasioned by the weaver's passing from side to side of the square carrying-basket, and not all the way round, as usual. The work is similar to that in an old-fashioned bird-cage, where the upright and horizontal wires are held in place by a wrapping of finer soft wire. The typical example of this wrapped or bird-cage twine is to be seen among the Makah Indians of the Wakashan family living about Neah Bay, Washington, and in the soft hats of Salish and Shahaptian. (See fig. 22.)

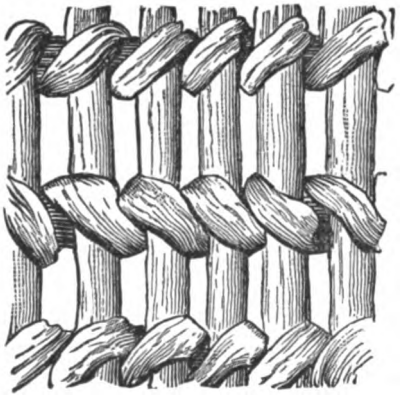


FIG. 21.
WRAPPED TWINED WEAVING.

In this type the warp and the horizontal strip behind the warp are both in soft material. The wrapping is done with a tough straw-coloured grass. When the weaving is beaten home tight, the surface is not unlike that of a fine tiled roof, the stitches overlying each other with perfect regularity. Such a simple style of fastening warp and weft together would seem to have occurred to tribes of savages in many parts of the world. Strange to relate, however, excepting in Washington and the ocean side of Vancouver Island, the process is not known. The exception to this statement is to be found in a few sporadic cases where, perhaps, Nutka and Makah women

had married into adjoining tribes. A few of the Salish women make similar ware, and it will be seen in basket hats of the Nez Percé Indians. A small collection of this ware came to the Museum through the Wilkes Exploring Expedition, but the ornamentation is decidedly Skokomish.

Figs. 23 and 24 show the detail of mixed twined weaving, diagonal twined weaving, and wrapped twined weaving, inside and outside view. The facility with which the basketmaker combines these weaves in the same texture gives her complete control over her material in the matter of ornamentation. The colouring of the two sides of the splints of cercis shows, in the figures, the difference between the outside and the inside of the basket. Another element of technic, not mentioned hitherto, is made apparent here in the requirements of these three different styles of workmanship controlling the space somewhat of the warp rods. Perhaps in no other tribe than the Pomo is there such free use of any number of textile methods on the same piece of workmanship to secure different results.

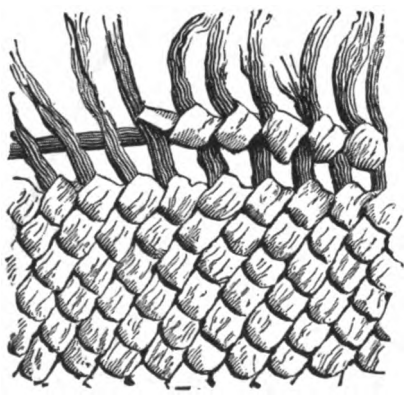


FIG. 22.
WRAPPED TWINED WEAVING.
Makah Indians, Washington.

It is possible to combine the several methods of twined weaving and, calling in the aid of colour, to produce good effects even in unpromising materials. Figs. 25 and 26 show back and front of a square from a Ute basket jar. The first two rows are plain twined work, then there come three rows of plain twined work also, though it does not look like it. It incloses warp stems in pairs, and the back and front are alike. It changes to diagonal merely by alternating warps. Below these three rows are diagonal twine, wrapped twine, or Makah

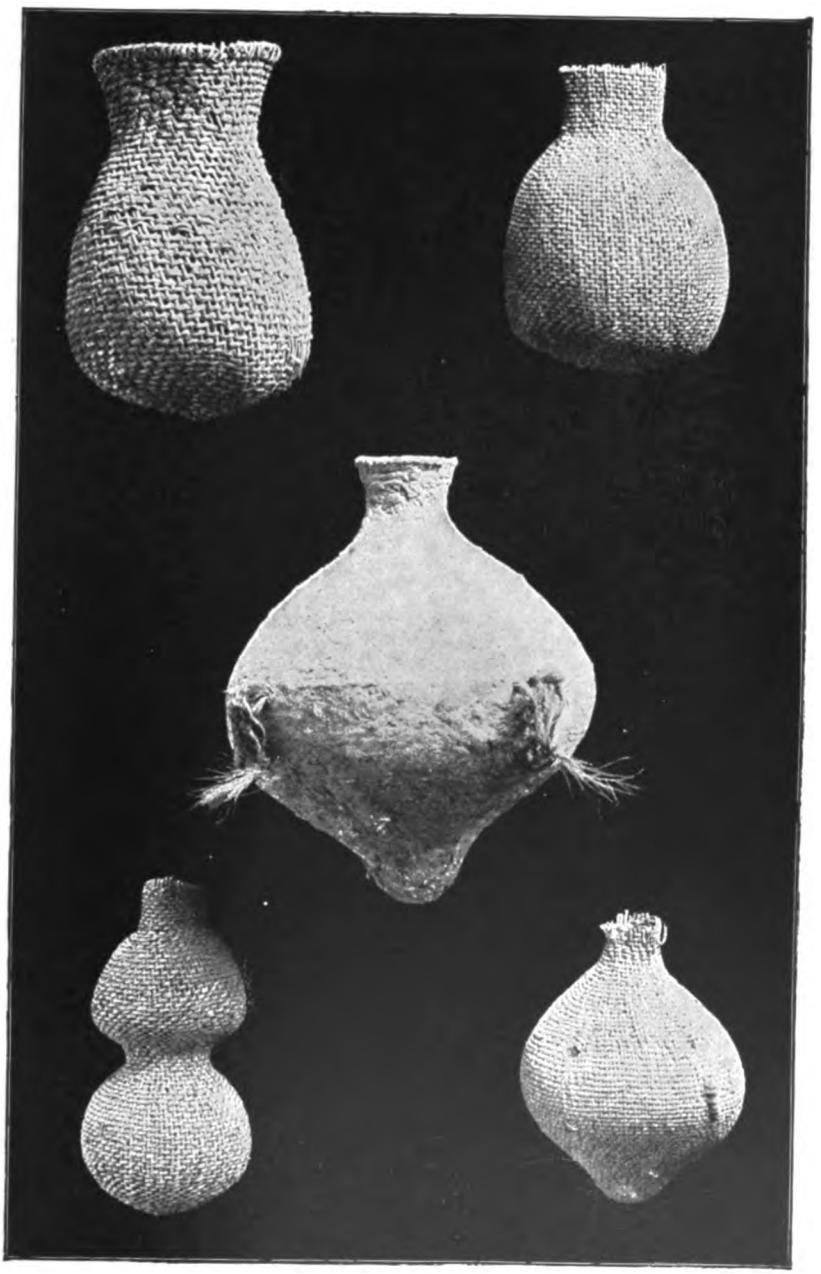


Plate 21. See page 75

1 2 3 4 5

OLD TWINED JARS FOR SEEDS AND WATER. UTES OF UTAH

Collections of U. S. National Museum

weave, combined with diagonal. Plate 21 contains five figures, all in diagonal twined weaving. They were made by the Ute Indians and collected long ago by Major J. W. Powell. They represent first of all the different results of the same technical

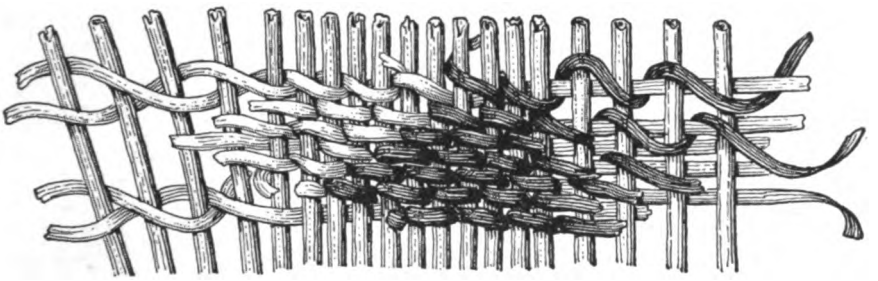


FIG. 23.
DETAIL OF MIXED TWINED WEAVING.
(Outside.)

process in varied materials. The specimens are all woven precisely alike. Fig. 1 has a coarse, inflexible warp. Fig. 2 has a finer warp, and hence the twists may be driven closer home. Fig. 4 shows the adaptation of modern shape in facili-

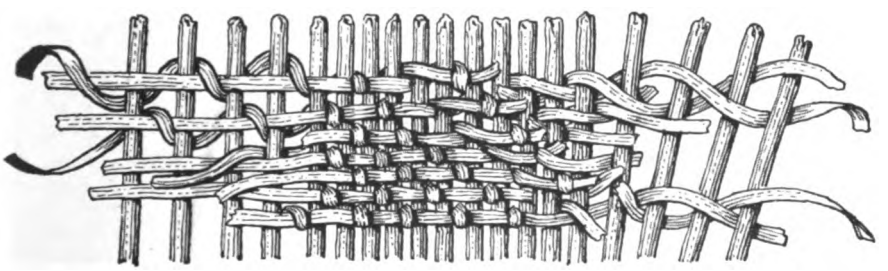


FIG. 24.
DETAIL OF MIXED TWINED WEAVING.
(Inside.)

tating the carrying. In fig. 5 a fine weft assumes a diagonal shape in being twisted, while fig. 3 is the last word in the story of the water-jar.

4. *Lattice twined weaving.*—The lattice twined weaving, so far as the collections of the National Museum show, is confined to the Pomo Indians, of the Kulanapan family, residing

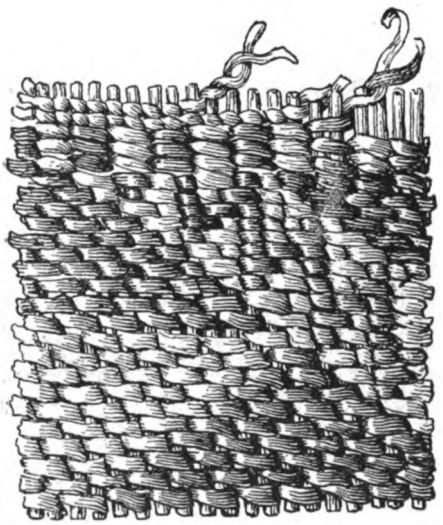


FIG. 25.
VARIETY IN TWINED WEAVING.
(Outside.)
American Anthropologist, III, 1901, fig. 18.

on Russian River, California. It is so called because it has a vertical and a horizontal warp resembling latticework. Dr. J. W. Hudson calls this technic Tee. This is a short and convenient word, and may be used for a specific name. The tee-twined weaving consists of four elements, (*a*) the upright warp of rods, (*b*) a horizontal warp crossing these at right angles, and (*c*, *d*) a regular plain twined weaving of two elements, holding the warps firmly together. (See fig. 27.)

In all these examples in the National Museum the horizontal or extra warp is on the exterior of the basket. On the outside the tee basket does not resemble the ordinary twined work, but on the inside it is indistinguishable. Baskets made in this fashion are very rigid and strong, and frequently the hoppers of mills for grinding acorns, and also water-tight jars, are thus constructed. The ornamentation is confined to narrow bands, the artist being restricted by the technic.

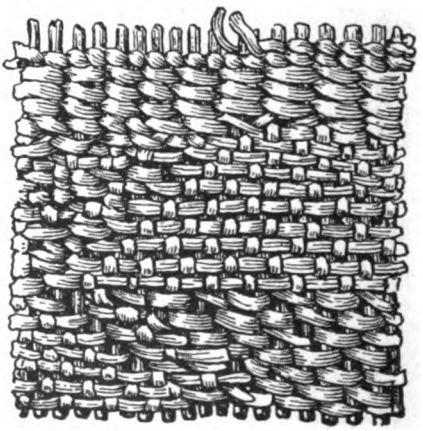


FIG. 26.
VARIETY IN TWINED WEAVING.
(Inside.)
American Anthropologist, III, 1901, fig. 21.

Plate 22 shows two

Plate 22. See page 76

TWINED BASKETS IN TEE OR THREE-STRAND WEAVE. INSIDE AND OUTSIDE DIFFERENT

Collection of C. P. Wilcomb

examples of tee weaving. The upper one, 19 inches in diameter, is made from Pinole rancheria, Mendocino County, California. The lower one is from Lake County, and both are in the collection of C. P. Wilcomb. The warp is in stems of the willow, the dull-coloured material of the weft is the root of sedge, the brown and very white colours are in the stem of cercis—the former colour being outside bark, the latter of wood next to the bark. (See also Plate 173.)

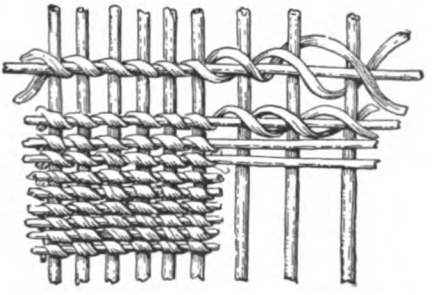


FIG. 27.
TEE OR LATTICE-TWINED WEAVING.
Pomo Indians, California.
American Anthropologist, III, 1901, fig. 22.

The technic of these two baskets is as follows: Beginning at the upper edge there is no special border, the ends of the warp stems being cut off; two or three rows of plain twined weaving are at the top; just below will be seen three or four

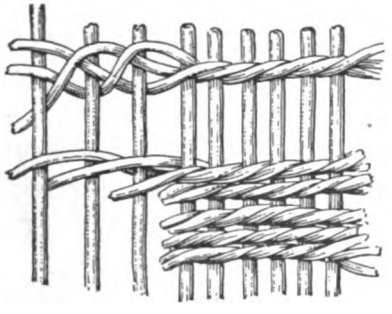


FIG. 28.
THREE-STRAND BRAID AND TWINED WORK. (Outside.)
American Anthropologist, III, 1901, fig. 23.

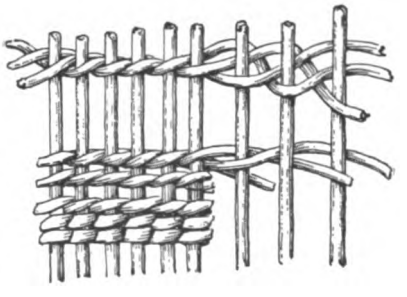


FIG. 29.
THREE-STRAND BRAID AND TWINED WORK. (Inside.)
American Anthropologist, III, 1901, fig. 24.

rows of alternating brown and white rectangles; these are also in plain twined weaving, although the twists pass over two or three warp stems instead of one; after that twined tee-weaving follows over the entire surface. With an ordinary hand-glass

the two sets of warp, vertical and horizontal, can be made out, and also the way in which the weft of thin splints is administered. The limitations of ornament to the narrow bands with triangles and parallelograms for the elements are clearly seen. On the plain bands a form of ornament will be noted, in which splints of cercis unite with those of sedge root to form an alternation of wood colour and very white. In the coloured bands the effects are produced by exposing now the outside or bark of the cercis, now the inside or wood colour of these splints artificially.

5. *Three-strand twined weaving.*—Three-strand twined weaving is the use of three weft splints and other kinds of weft elements instead of two, and there are four ways of administering the weft:

(*a*) Three-strand twine.
(*b*) Three-strand braid.
(*c*) Three-strand, false embroidery, Tlinkit.
(*d*) Frapped twine, Thompson River.

It will be seen in studying these four methods that they are partly structural and partly ornamental, especially the last two. Inasmuch however, as the Indian woman makes her ornamental work a part of her industrial work, the four methods may be studied here. Very little was known among the American aborigines concerning additional ornaments given to the textile after the foundation was woven. The part which furnishes strength to the fabric and that which gives decoration were in technic one and the same process.

(*a*) *Three-strand twine.*—In this technic the basket-weaver holds in her hand three weft elements of any of the kinds mentioned. In twisting these three, each one of the strands, as it passes inward, is carried behind the warp stem adjoining, so that in a whole revolution the three weft elements have in turn passed behind three warp elements. After that the process is repeated. By referring to the lower halves of figs. 28 and 29, the outside and the inside of this technic will be

made plain. On the outside there is the appearance of a three-strand string laid along the warp stems, while on the inside the texture looks like a plain twined weaving. The reason for this is apparent, since in every third revolution one element passes behind the warp and two remain in front. Three-strand twined work is seldom used over the entire sur-

FIG. 30.
BASKET-JAR IN THREE-STRAND TWINE.
Hopi Indians, Arizona.
Collected by J. W. Powell.

face of a basket. In fig. 30 will be seen the drawing of a very old piece of twined work from the ancient Hopi or Moki Pueblo. The bottom of this old basket jar and a portion of the body, as will be seen are covered with plain twine weft. The shoulder and neck and two bands of the body are in three-strand twined weaving. A small portion of the inside, shown in the top of the illustration, presents the appearance of

small two-strand twined work. In fig. 31 is shown a square inch from the surface of this jar, enlarged to make plain the appearance of the two types of technic. The upper portion of the figure has all the appearance of twilled and twined work in two-strand weft. The three-strand work shown in this figure is a Ute motive. The U. S. National Museum collections represent at least seven different styles of basketry technic attributed to the Hopi people of Tusayan, and philologists have come to the conclusion that the Hopi are a very mixed people.

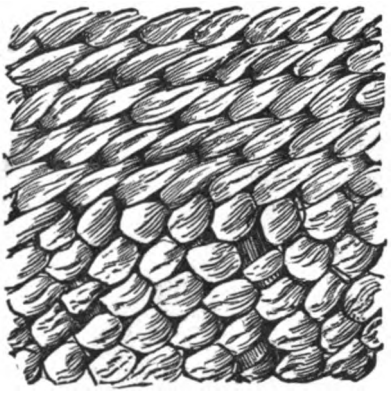


FIG. 31.
THREE-STRAND AND PLAIN TWINED WEAVING.

(*b*) *Three-strand braid.*—In three-strand braid the weft elements are held in the hand in the same fashion, but instead of being twined simply they are plaited or braided, and as

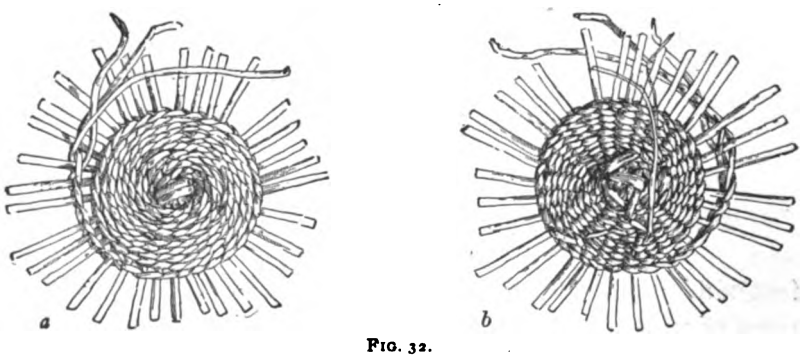


FIG. 32.
THREE-STRAND BRAID.
a, outside, *b*, inside.

each element passes under one and over the other of the remaining two elements it is carried behind a warp stem. This process is better understood by examining the upper part

of fig. 32, *a* and *b*. On the surface, when the work is driven home, it is impossible to discriminate between three-strand twine and three-strand braid. The three-strand braid is found at the starting of all Pomo twined baskets, no matter how the rest is built up.

Fig. 33 is a conical carrying-basket of the Klamath Indians of Oregon, collected by L. S. Dyar. It is made of coarse stems

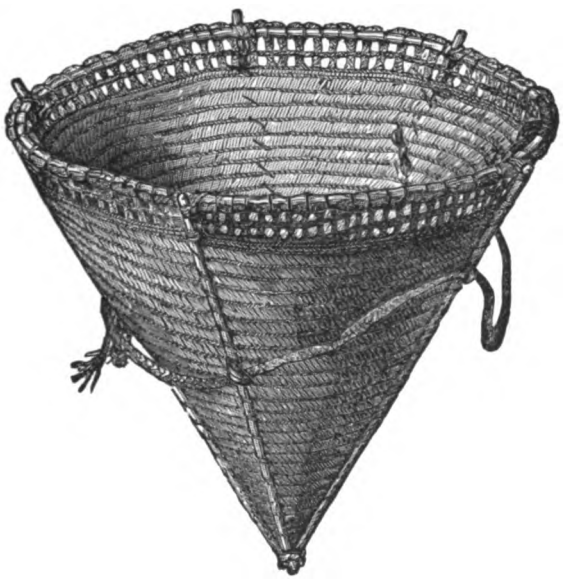


FIG. 33.
CARRYING-BASKET, THREE-STRAND BRAID.
Klamath Indians, Oregon.
Cat. No. 24,104, U.S.N.M. After W. H. Holmes.

of rushes. The warp begins with a few stems brought together to a point at the bottom and as the specimen widens out fresh warp stems are added. These are securely joined together by a continuous coil of weft, which is a three-strand braid. At the beginning these turns of the coil touch one another, but as the work progresses and the basket widens the distance from one row to the next increases until they are nearly an inch apart at the top. The braiding is done from the outside, two of the stems always showing there and only one on the

inside, resembling common twined weaving. This is the only specimen in the Museum in which the whole surface is braided. In many twined baskets of the Pomo an inch or so at the bottom is thus woven. The top is finished off in the following manner: Three warp-ends are braided together for at least 2 inches, turned down, and cut off. The hook-shaped ends are held in place by a row of common twined weaving at the top. Just below this and close to the ends is a row of three-strand braid. Another row of the same kind is made half-way between the upper edge of the solid weaving and the border. A hoop of wood is held in place on the inside by a wrapping of coarse twine. The appearance of three-strand braid in the drawing on the inside of the basket is given by the strands of twined weaving and the ends of the warp bent over. The basket is strengthened on the outside by five vertical rods, and the carrying-string is in three-strand braid, precisely as in the body and margin of the basket. Height 22 inches, diameter 23 inches. In the collection of Dr. C. Hart Merriam are two closely woven Klamath baskets in the same technic (see Plate 174). Styles (*c*) and (*d*) belong rather to ornamentation, and will be described under that heading.

Something should be said in this connection about the manner of laying the foundation for weaving baskets. In many of the specimens illustrated in this book it will be seen that very little tasteful care has been bestowed upon this part of the work. The Eskimos, for instance, do not know how, seemingly, but use a piece of rawhide, and it is said that the Indians of British Columbia formerly inserted a piece of board or wood at the bottom of their coiled baskets and sewed the coils around an edge of it, but there is method in much of the basket-weaving in this point, as will be seen on examining the plates. Miss Mary White, in her "More Baskets and How to Make Them," has worked this subject out very carefully.*

* How to Make Baskets, New York, 1902; also, More Baskets and How to Make Them, New York, 1903.

Figs. 34 to 39, inclusive, show the result of her studies.

Fig. 34 is the simplest form of starting the bottom of a basket. Four warp stems are arranged in pairs and crossed

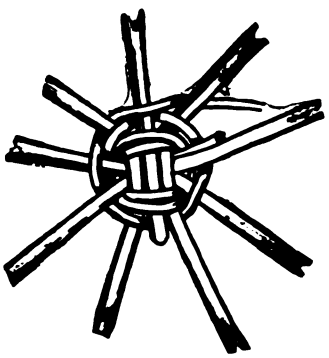


FIG. 34.
WARP STEMS CROSSED IN PAIRS.
After Mary White.

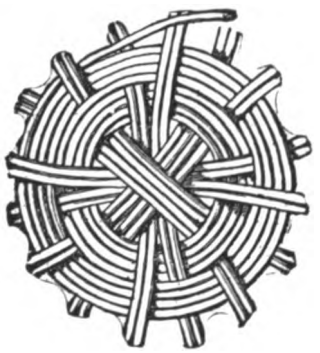


FIG. 35.
WARP STEMS CROSSED IN FOURS.
After Mary White.

at the center. A strip of wood or a flexible stem is wound twice around the intersection. The figure also shows how additional warp stems may be introduced into this pattern,

FIG. 36.
SIXTEEN STEMS WOVEN IN FOURS.
After Mary White.

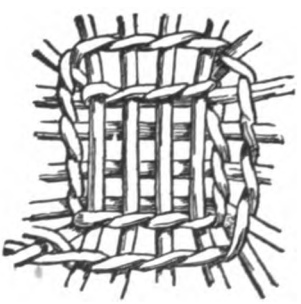


FIG. 37.
WARP STEMS CROSSED IN FOURS AND TWINED.
After Mary White.

being thrust between the regular stems. Once they are held firmly in place by two or three rows of common basket weaving, additional warp stems are added, and they are bent out radially as a foundation for the work.

Fig. 35 shows how a start may be made with 16 warp stems crossing in groups of four at the center. Two sets begin at once to divide and radiate, and after they are held together by three rows of weft the other eight are spread out in the same way. The drawing illustrates exactly the manner in which this is done.

FIG. 38.
SIX WARP STEMS PARALLEL.
After Mary White.

Fig. 36 shows another method of beginning with 16 warp stems, plaiting them into checker pattern at first, then afterward spreading them out radially.

Fig. 37 brings us into the Hopi Indian type of twined weaving. Here four stems in one direction cross the same number at right angles and are held in place by a row of twined weaving, additional warp stems being inserted at the corners, which spread out radially.

Fig. 38 is a Hopi application of coiled sewing to the beginning of the basket. In Fig. 39 the warp stems are woven together in wickerwork in two sets; the first vertical, the second horizontal. As soon as they are in place and held together the work proceeds as in ordinary weaving.

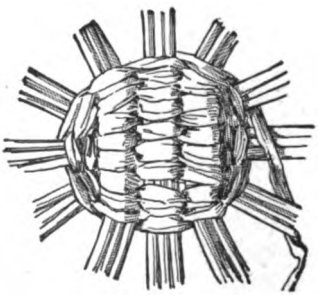
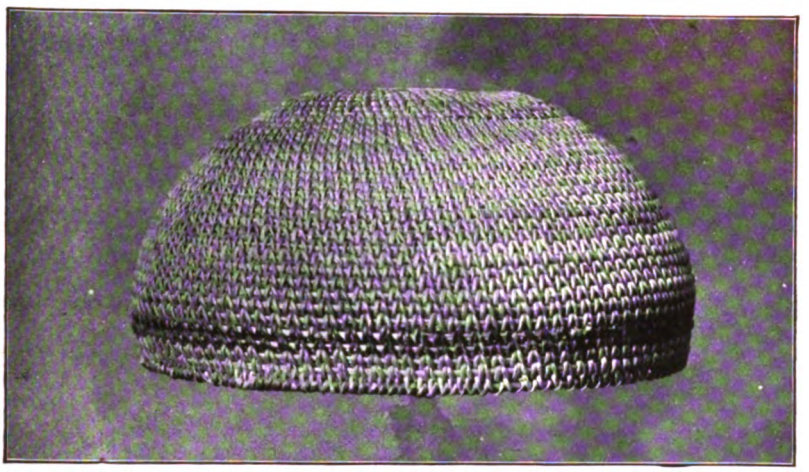


FIG. 39.
WARP STEMS CROSSED IN THREES; HELD BY WICKER.
After Mary White.

COILED BASKETRY

Coiled basketry is produced by an over-and-over sewing with some kind of flexible material, each stitch interlocking with the one immediately underneath it. The exception to this is to be seen on Salish, Maidu, and other baskets, in which the passing stitch is driven through the wood of the one underneath and splits it.



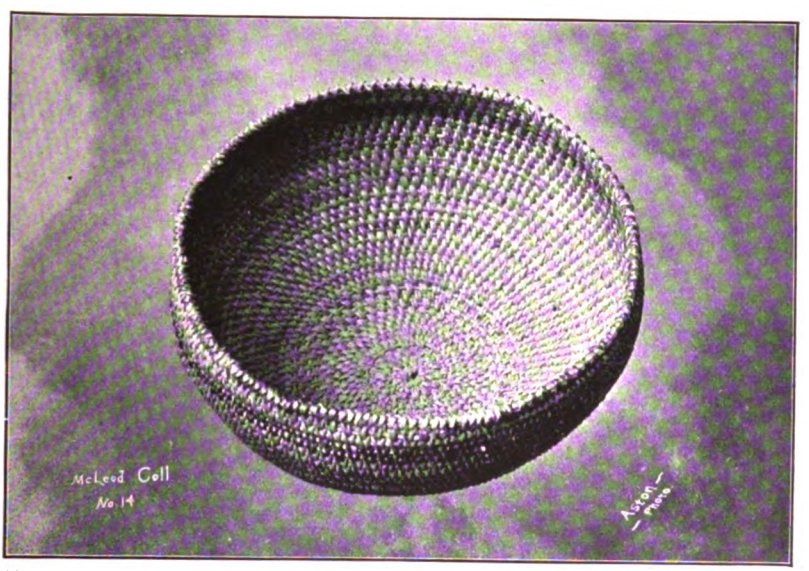


Plate 23. See page 85

COILED BASKET WITH SPLIT STITCHES, MU-WA TRIBE, CALAVERAS CO., CAL.

Collection of E. L. McLeod

In the coiled basketry of British Columbia, as well as here and there farther south, this splitting of stitches, so clumsy looking when done without plan, is turned into an element of beauty. The top of every stitch is carefully bifurcated or trifurcated, so that to the uninitiated the sewing appears to have been done vertically instead of horizontally. This type of work may be called furcate coil. (See Plate 23 and figs. 51 and 55.)

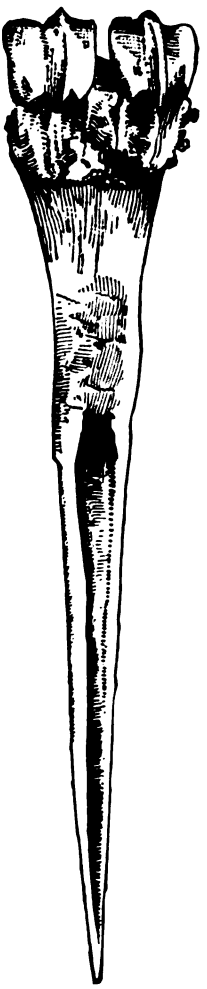


FIG. 40.
BONE AWL FOR COILED BASKETRY.
Collected by Edward Palmer.

The specimen (Plate 23) is a remarkable old piece of Mu-wa work, from Calaveras County, California. Diameter, 6½ inches; depth, 4 inches; colours, dark wood, with line of brown around top. This is one of the finest exhibitions of furcated stitches. It resembles common Ute basketry of the two-stem variety, and in the sewing the stitches are not driven home tight, but left as wide apart as possible. On the inside of the basket it is plain coiled sewing, showing the foundation rod clearly between the stitches. Passing the awl-point between the stitches on the inside, it is carefully pushed through so as to divide the sewing-splint of the previous coil exactly in the middle. This gives the appearance of embroidery stitches from the center of the bottom to the outer margin. This specimen of furcated stitching is in the collection of Edward L. McLeod. Doctor Merriam secured an example from a Mu-wa squaw in Calaveras County, California, on the western slope of the Sierra. Those familiar with the coiled basket-making taught in the industrial schools will compare this

work with their own, in which the coloured raffia is hidden in the foundation for a space of wrapping and comes out at the point where the double stitch is to be made.

The transition from lace work and coiled basketry is interesting. In the netted bags of pita fiber, common throughout middle America, in the muskemoots or Indian bags of fine caribou-skin thong from the Mackenzie River district, as well as in the lace-like netting of the Mohave carrying-frames and Peruvian textiles, the sewing and interlocking constitute the whole texture, the woman doing her work over a short cylinder or spreader of wood or bone, which she moves along as she works. When the plain sewing changes to half hitches, or stitches in which the moving part of the filament or twine is wrapped or served one or more times about itself, there is the rude beginning of point-lace work. This is seen in basketry and soft wallets of the Mackenzie River tribes, the Hopewell mound relics in Ohio, here and there in California, and especially among the Fuegians, as well as in many pieces from various parts of the Old World. (See figs. 59 and 115.)

The sewing-materials vary with the region. In the Aleutian Islands it is of delicate straw; in the adjacent region it is spruce root; in British Columbia it is cedar or spruce root; in the more diversified styles of the Pacific States every available material has been used—stripped leaf, grass stems, rushes, split root, broad fillets, and twine, the effect of each being well marked. The gathering and preparation of these materials for use have already been described in the first portion of this paper. It is understood that, as in woven basketry, the grasses, roots, and splits of wood are soaked in water and kept as pliable as possible until the work is done.

In all coiled basketry, properly so called, there is a foundation more or less rigid, inclosed within stitches, the only implement being an awl of some kind. Fig. 40 shows the metatarsal of an antelope sharpened in the middle and harder portion of the column, the joint serving for a grip for the hand.

It was the universal prehistoric sewing-implement of savage women, and persists to our day.

In every living tribe of basketmakers these awls are among the commonest of woman's tools, most serviceable in sewing garments as well. They are dug up in mounds, found in caves, and are rarely absent from the work-baskets of mummies in the arid regions.*

Frank H. Cushing was of the opinion that the bone awl was far better for fine basketwork than any implement of steel; the point, being a little rounded, would find its way between the stitches of the coil underneath, and not force itself through them. The iron awl, being hard and sharp, breaks the texture and gives a very rough and clumsy appearance to the surface, as will be seen in fig. 51.

Coiled basketry in point of size presents the greatest extremes. There are specimens delicately made that will pass through a lady's finger-ring, and others as large as a flour-barrel; some specimens have stitching-material one-half inch wide, as in the Pima granaries, and in others the root material is shredded so fine that nearly 100 stitches are made within an inch of space. In form the coiled ware may be perfectly flat, as in a table-mat, or built up into the most exquisite jar-shape. In design the upright stitches lend themselves to the greatest variety of intricate patterns.

Coiled basketry may be divided into ten varieties, based on structural characteristics.

The foundation of the coil may be (1) a single element, either splint, or stem, or rod; (2) a stem or other single element, with a thin welt laid on top of it; (3) two or more stems one over another; (4) two stems or other elements laid side by side, with or without a welt; (5) three stems in triangular position; (6) a bundle of splints or small stems; (7) a bundle of grass or small shreds.

The stitches pass around the foundation, in progress (1) in-

* Smithsonian Report, 1882, p. 724, fig. 3.

terlocking with and sometimes splitting stitches, but not inclosing the foundation underneath; (2) under one rod of the coil beneath, however many there may be; (3) under a welt of the coil beneath; (4) through splints or other foundation, in some cases systematically splitting the sewing-material underneath. With these explanations it is possible to make the following ten varieties of coiled basketry, matting, or bagging:

A. Coiled work without foundation.
B. Simple interlocking coils.
C. Single-rod foundation.
D. Two-rod foundation.
E. Rod-and-welt foundation.
F. Two-rod and splint foundation.
G. Three-rod foundation.
H. Splint foundation.
I. Grass-coil foundation.
K. Fuegian coiled basketry (see p. 103).

These will now be taken up systematically and illustrated. (See fig. 41.)

A. *Coiled work without foundation.*—Specimens of this class have been already mentioned. The sewing-material is babiche or fine rawhide thong in the cold north, or string of some sort farther south. In the Mackenzie Basin will be found the former, and in the tropical and subtropical areas the latter. If a plain, spiral spring be coiled or hooked into one underneath, the simplest form of the open coiled work will result. An improvement of this is effected when the moving thread, in passing upward, after interlocking, is twined one or more times about its standing part. (See figs. 41 A and 100.)

The technical process just mentioned is practised among the Athapascan tribes of the Mackenzie River drainage. It is doubtful whether anciently the predecessors of these Indian women did such fine work in rawhide. The steel-bladed knife made slender babiche possible, and the thrift brought about

by the Hudson Bay Company made it desirable. But it will be seen that the Mound Builders had the weave and could produce texture in flax even more delicate than the muskemoots or hunting-bags of the northern tribes.

Fig. 42 represents a carrying-frame and net of the Pima and other tribes on our Mexican border. It is supported by a rude framework of sticks. The network is of agave twine, and is

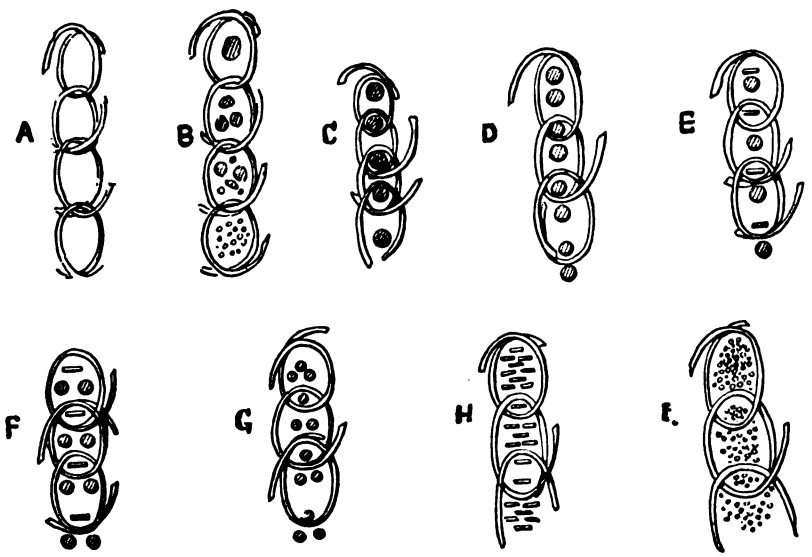


FIG. 41.
CROSS-SECTIONS OF VARIETIES IN COILED BASKETRY.

made of interlocking coils, looking as all coiled basketry would if the foundation were removed.

Further on, illustrations will be given showing the wide extent of this technical process of coiled basketry without foundation. Examples in the United States National Museum come from as far south as Paraguay and even the Strait of Magellan. It is in common use as far north as northern Mexico. Both the possession of different material and the demands of a tropical life have occasioned the employment of this particular technic in articles of common use about the household. Its

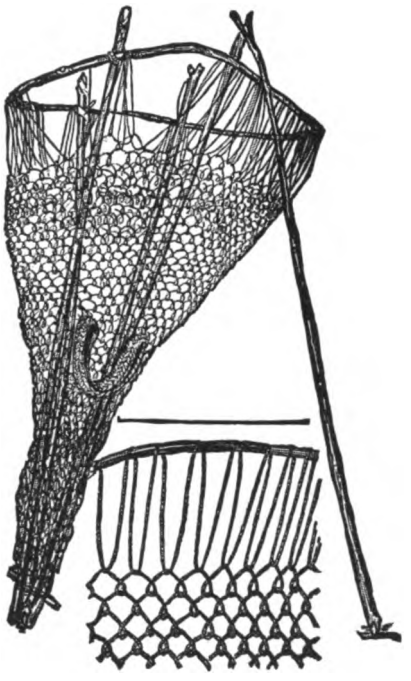


FIG. 42.
CARRYING-BASKET.
Pima Indians, Arizona.
Cat. No. 126,680, U.S.N.M. Collected by Edward Palmer.

relation to coiled basketry and beadwork is shown by the fact that women, in making the fabric, use a needle to carry the thread or string around through the row of work preceding. A small rod or mesh-gauge is used to secure uniformity in the size of the meshes.

B. *Simple interlocking coils.*—Coiled work in which there may be any sort of foundation, but the stitches merely interlock without catching under the rods or splints or grass beneath. This form easily passes into those in which the stitch takes one or more elements of the foundation, but in a thorough ethnological study small differences cannot be overlooked (see fig. 41 B).

Fig. 43 represents this style of workmanship on a coiled basket in grass stems from Alaska, collected by Lucien M. Turner. The straws for sewing merely interlock without gathering the grass roll.

In the imbricated basketwork of British Columbia and Washington, the sewing is done with splints of cedar root, and the stitches interlock. Two quite distinct styles of foundation

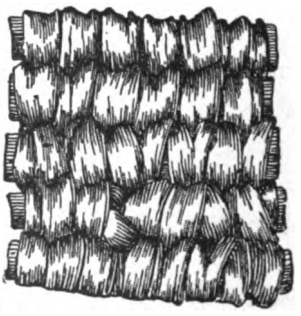


FIG. 43
DETAIL OF INTERLOCKING STITCHES.

are used, namely, bunches of splints taken from the more brittle and rough interior of the cedar root, and two flat strips of the smooth layer on the outside of the root. The surface of the one will be rugose, of the other flat and smooth (see figs. 52, 53, and 54 and Plates 156–161).

Figs. 44 and 45 represent a type of coiled work in vogue among the Mescalero Apaches. As has been said previously,

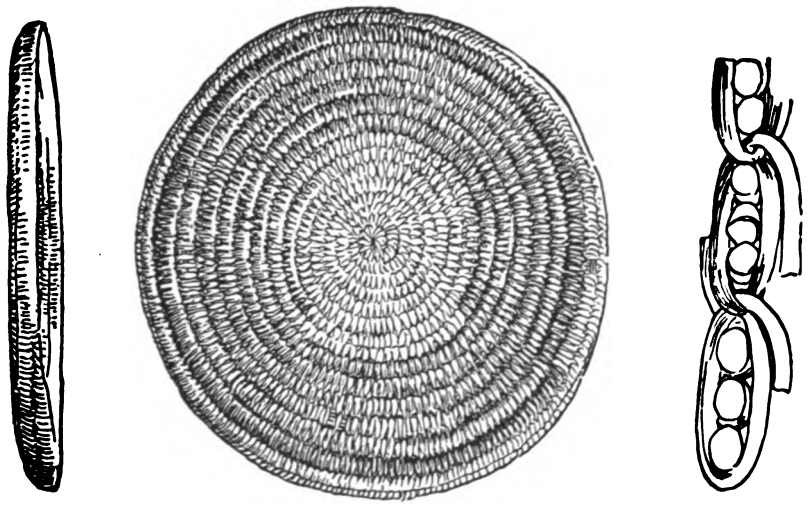


Fig. 44.
FOUNDATION OF THREE RODS LAID VERTICALLY.
Mescalero Apache Indians.

the Apache Indians, who live in the arid regions of Arizona, made the foundations of their coiled basketry of hard rods. In various tribes these rods are arranged in a foundation after different patterns. It will be seen by examining the drawing here given that three rods form the basis of the coil. They are laid one on another in a vertical row, the stitches simply interlocking so that the greatest economy of work is effected. It is not known that any other tribe in America practises this peculiar arrangement of the foundation rods. This specimen (Cat. No. 211,941, in the United States National Museum) was collected by F. M. Covert.

Plate 24 shows a style of coiled weaving called openwork. This specimen, in the collection of C. E. Rumsey, Riverside, California, is termed a grasshopper basket, but it belongs to a type of technic that has a very wide distribution, and probably has nothing to do with holding live insects. The foundation is a bundle of shredded material or grass. The sewing is a splint of hard wood. This is wrapped a certain number of times around the foundation and then caught under the sewing of the coil underneath, the stitches interlocking. Perhaps a few bits of the foundation are caught also in the stitch. After two stitches are made in this way, the wrapping continues. It is possible, by counting this last as well as the number of stitches, to reproduce beautiful patterns on the surface. The ornamentation also may be varied by the use of different coloured splints. This specimen is from the Wikchumni (Mariposan) Indians of middle California, but examples are in the National Museum collected from Norway, Porto Rico, and Peru (see Plates 224 and 248).

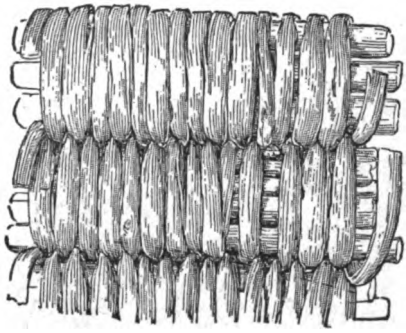


Fig. 45.
DETAIL OF FIG 44.

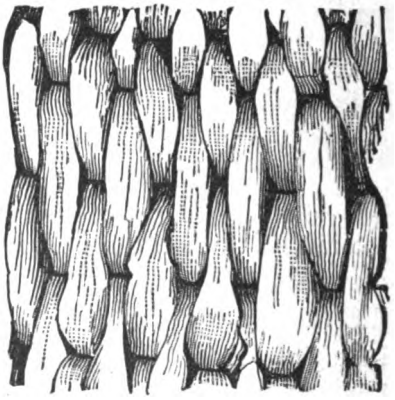


Fig. 46.
DETAIL OF SINGLE-ROD COIL IN BASKETRY.

C. *Single-rod foundation.*—In rattan basketry and Pacific coast ware, called, by Dr. J. W. Hudson, Tsai, in the Pomo language, the foundation is a single stem, uniform in diameter.

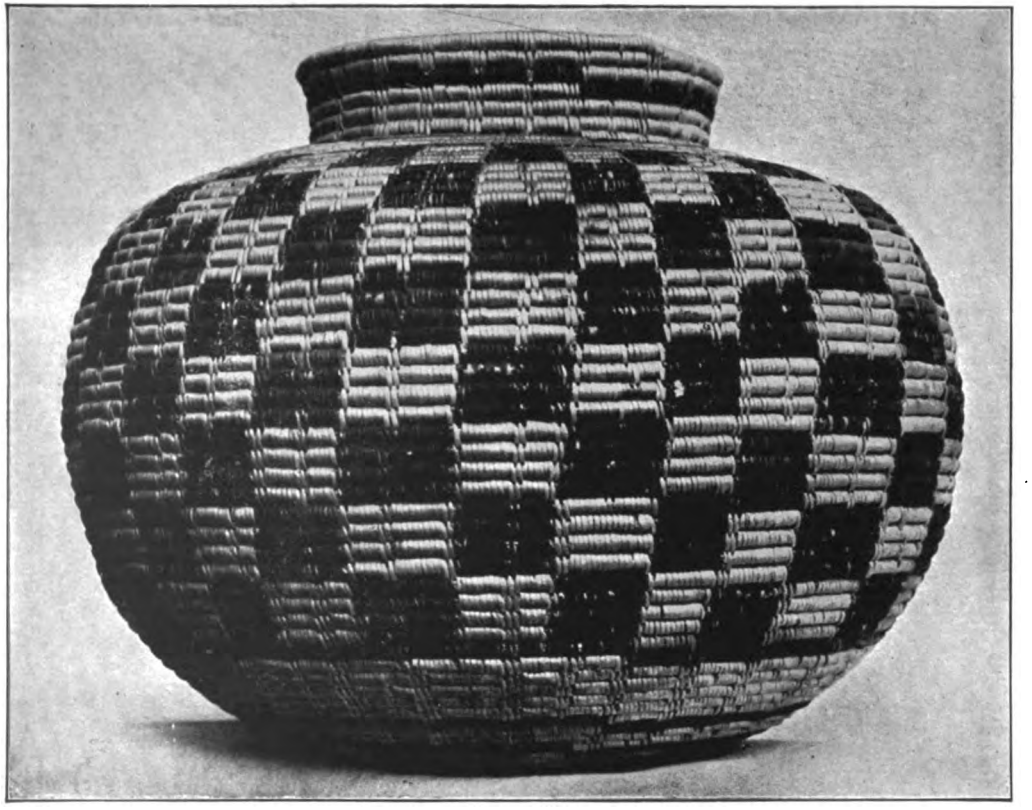


Plate 24. See page 92

BASKET IN OPENWORK COILING, ONLY A FEW STITCHES CATCH THE COIL UNDERNEATH

Collection of C. E. Rumsey

The stitch passes around the stem in progress and is caught under the one of the preceding coil, as in fig. 41 C. In a collection of Siamese basketry in the United States National Museum the specimens are all made after this fashion. The foundation is the stem of the plant in its natural state; the sewing is with splints of the same material, having the glistening surface outward. As this is somewhat unyielding, it is difficult to crowd the stitches together, and so the foundation is visible between. California is not far behind the East in the quality of material, willow for the basis of the coil, and plants in a variety of colours for the sewing The Siamese coiled basketry has little of design on its surface, but the American basketmaker may fix whatever her imagination may suggest. The effect of the plain stitching is pleasing to the eye by reason of the regular broken surface. In America, single-rod basketry is widely spread. Along the Pacific coast it is found in northern Alaska and as far south as the border of Mexico. The Pomo Indians use it in some of their finest work. The roots of plants and soft stems of willow, rush, and the like are used for the sewing, and, being soaked thoroughly, can be crowded together so as to entirely conceal the foundation (see fig. 46).

Plate 25 represents a collection of Pomo treasure-baskets, all in single-rod foundation, called Tsai by Dr. Hudson and bam tsha or bam tshai by Carl Purdy. These specimens are in the collection of C. P. Wilcomb; the foundation is of willow rod, the sewing-material of sedge root, the design in the cercis splints, the decoration with shells, beads, and partridge plumes. The method of sewing is on all of these baskets the same as shown in fig. 41 C.

Plate 26, Cat. No. 89,801, U.S.N.M., is from Point Barrow, Alaska, and was collected by Captain P. H. Ray, United States Army. The material is shoots and roots of willow, and the specimen was secured from Eskimo people living at the extreme northern point of Alaska. It had evidently been procured, however, from Indians near by. On the bottom, small rods are

used for the foundation, and the sewing is in straight lines backward and forward until this portion is finished. Here the foundation-rods are somewhat larger and the sewing-splints wider. Comparing this specimen, then, with a great many others from the same area, the uniformity in size of the foundation-rod is noticeable. It will also be noted that the stitches are not driven home closely, a feature which occurred over and over again in coiled basketry between Point Barrow and the Republic of Mexico.

D. *Two-rod foundation.*—One rod in this style lies on top of the other; the stitches pass over two rods in progress and under the upper one of the pair below, so that each stitch incloses three stems in a vertical series (fig. 47). A little attention given to fig. 41 D will demonstrate that the alternate rod, or the upper rod, in each pair will be inclosed in two series of stitches, while the other or lower rod will pass along freely in the middle of one series of stitches and show on the outer side. Examples of this two-rod foundation are to be seen among the Athapascan tribes of Alaska, among the Pomo Indians of the Pacific coast, and among the Apache of Arizona. An interesting or specialised variety of this type is seen among the Mescaleros of New Mexico, who use the two-rod foundation, but instead of passing the stitch around the upper rod of the coil below, simply interlock the stitches so that neither one of the two rods is inclosed twice. This Apache ware is sewed with yucca fiber and the brown root of the same plant, producing a brilliant effect, and the result of the special technic is a flat surface like that of pottery. The United States National

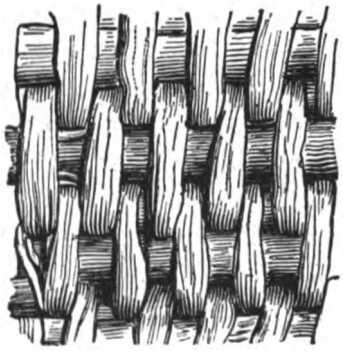


Fig. 47
FOUNDATION OF TWO RODS, VERTICAL.

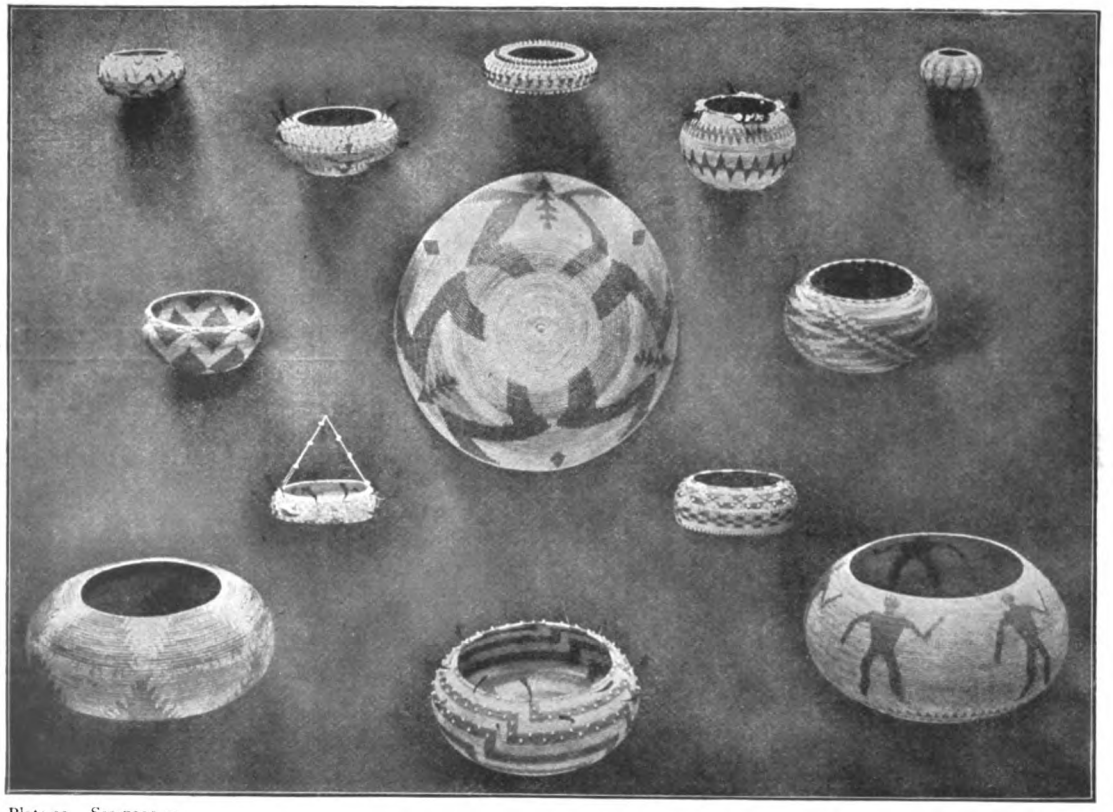


Plate 25. See page 93

TREASURE BASKETS IN COILED WEAVING, AND DECORATED WITH SHELL MONEY AND QUAIL PLUMES. POMO INDIANS, CALIFORNIA

Collection of C. P. Wilcomb

Museum possesses a single piece of precisely the same technic from the kindred of the Apache on the Lower Yukon (see figs. 44 and 45).

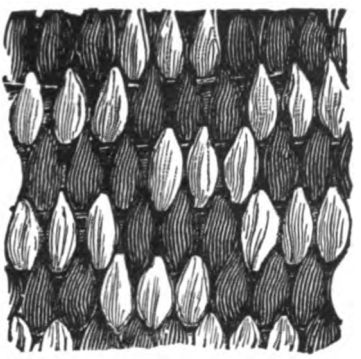


Fig. 48.
ROD-AND-WELT FOUNDATION.

E. *Rod-and-welt foundation.*—In this kind of basketry the single-rod foundation is overlaid by a splint or strip of tough fiber, sometimes the same as that with which the sewing is done; at others, a strip of leaf or bast. The stitches pass over the rod and strip that are on top, down under the welt only of the coil below, the stitches interlocking. The strip of tough fiber between the two rods which serves for a welt has a double purpose—strengthening the fabric and chinking the space between the rods (fig. 48). This style of coil work is seen on old Zuñi basket-jars and on California examples. This type of foundation passes easily into forms C, D, E, and F. In fact, it is impossible to distinguish between them without marring the specimen (see fig. 41).

Fig. 49.
WATER-JAR IN COILED BASKETRY.
Wolpi, Arizona.
Cat. No. 42,128, U.S.N.M. Collected by James Stevenson.

The specimens shown on Plate 27 are a water-bottle and a gathering-basket of the Utes—that is, they are of Ute motive. Such pieces, however,

are often seen among other tribes and in some of the recent pueblos. By looking carefully at the surface of the pictures, it will be seen that there may be two rods, the upper much smaller than the other; or on the top of the principal rod will be a splint or two of material. The foundation of such basketry is not uniform in composition, but in motive they are all the same. The strength of the basket is in the principal rod. The joint is made stronger by having between the stitches of two coils an additional rod or smaller piece. There are no wide gaps separating any two styles of weaving, and it will be easily seen that this Ute type passes readily into other forms. Cat. Nos. 84,596 (upper figure), 42,126 (lower figure), U. S. N. M.

F. *Two-rod and splint foundation.*—In this style the foundation is made thicker and stronger by laying two rods side by side and a splint or welt on top to make the joint perfectly tight. The surface will be corrugated. Tribes practising this style of coiling generally have fine material, and some of the best ware is so made up. It passes easily, as one might guess, into the Lillooet style, in which the two elements of the foundation are thin and flat. Fig. 49 is a water-jar from the Wolpi pueblo, one of the Hopi group, collected long ago by James Stevenson. It is Cat. No. 42,129, U.S.N.M., and was first figured in the Second Annual Report of the Bureau of Ethnology (see fig. 41 F).

Plate 28 represents two fine old coiled baskets from the pueblo of Sia, on the Rio Grande River, New Mexico. In addition to the structure, which consists of two rods and a splint above sewed with willow splints, the stitches interlocking and catching in the welt below, the ornamentation a stepped design, suggestive of pueblo architecture on the upper figure and spirals made up of coloured rectangles on the lower figure, needs to be merely pointed out. The characteristic sought to be illustrated here in this connection is the false braid made on

Plate 27. See page 95

WATER JAR AND TRINKET BASKET

Like the Utes, the Hopi use the ancient and unbreakable gourd for long journeys over the arid region. Hanging from the rafters of the dwelling, one often sees the deep bowl-like basket, with flaring rim, bought from the Havasupai of Cataract Canyon.
In it are kept beads, feathers, and other trinkets used in ceremonies.

Collected by J. Stevenson and V. Mindeleff

Plate 27. See page 95

Water Jar and Trinket Basket

Like the Utes, the Hopi use the efficient and unbreakable *wikasro* for long journeys over the arid region. Hanging from the rafters of the dwelling, one often sees the deep bowl-like basket, with flaring rim, bought from the Havasupai of Cataract Canyon. In it are kept beads, feathers, and other trinkets used in ceremonies.

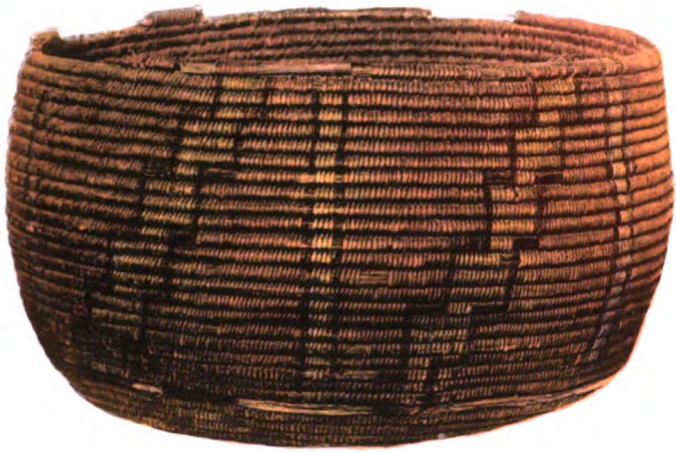
Collected by J. Stevenson and V. Mindeleff

Plate 28. See page 96

Rare Old Baskets

Among the treasures of the Southwest are these examples of woman's skill in the olden time. Some of these baskets are hundreds of years old, and have survived in the caves and cliffs, or in the secret rooms of the pueblo folk, deep in the house cluster.

Collected by James Stevenson



the surface produced by sewing a single splint in a figure-of-eight weaving, shown in the plate. The modern Indians of this pueblo do not make basketry of this character, and it is altogether reasonable to think that in the olden times these pieces came into the possession of these people by traffic from Shoshonean tribes near by. Cat. No. 134,213, U. S. N. M. Collected by James Stevenson.

G. *Three-rod foundation.*—This is the type of foundation called by Carl Purdy Bam shi bu, from bam, sticks, and sibbu, three. Among the Pomo and other tribes in the western part of the United States the most delicate pieces of basketry are in this style. Dr. Hudson calls them "the jewels of coiled basketry." The surfaces are beautifully corrugated, and patterns of the most intricate character can be wrought on them. The technic is as follows: Three or four small willow stems of uniform thickness serve for the foundation, as shown in fig. 50; also in cross-section in fig. 41 G. The sewing, which may be in splints of willow, black or white carex root, or cercis stem, passes around the three stems constituting the coil, under the upper one of the bundle below, the stitches interlocking. In some examples this upper rod is replaced by a thin strip of material serving for a welt (see fig. 41 F). In the California area the materials for basketry are of the finest quality. The willow stems and carex root are susceptible of division into delicate filaments. Sewing done with these is most compact, and when the stitches are pressed closely together the foundation does not appear. On the surface of the Bam shi bu bas-

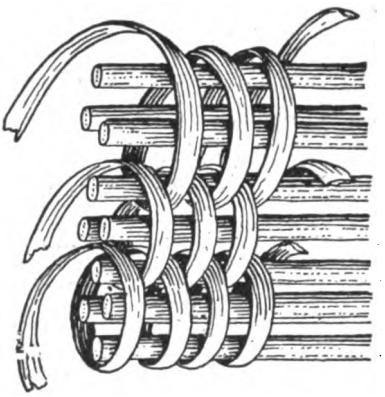


FIG. 50.
FOUNDATION OF THREE RODS, STITCHES CATCHING ROD UNDERNEATH.

ketry the Pomo weaver adds pretty bits of bird feathers and delicate pieces of shell. The basket represents the wealth of the maker, and the gift of one of these to a friend is considered to be the highest compliment.

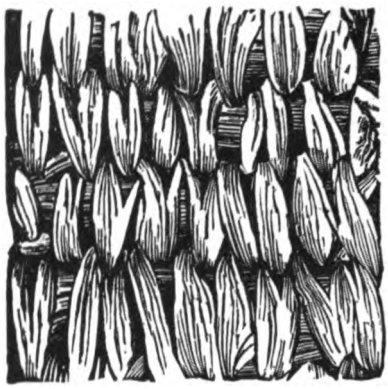


FIG. 51.
FOUNDATION OF SPLINTS.

Plate 29 is a beautiful example of Bam shi bu coiled basketry, having a foundation of three bams, or shoots of Hind's willow (*Salix sessilifolia*). The sewing of the lighter portions is in carefully prepared roots of a sedge, Kahum (*Carex barbarae*), while the designs are in the roots of a bulrush, Tsuwish (*Scirpus maritimus*). Red feathers of the California woodpecker are scattered over the surface. This faultless specimen, now in the collection of C. P. Wilcomb, was made in the year 1896 by Squaw Mary, a noted basketmaker,

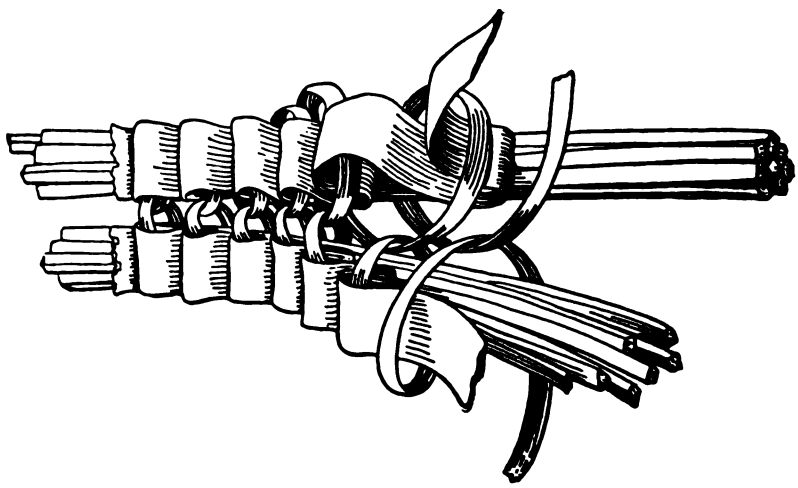


FIG. 52.
IMBRICATED WORK DETAIL, CALLED KLIKITAT.
Showing method of concealing coil stitches.

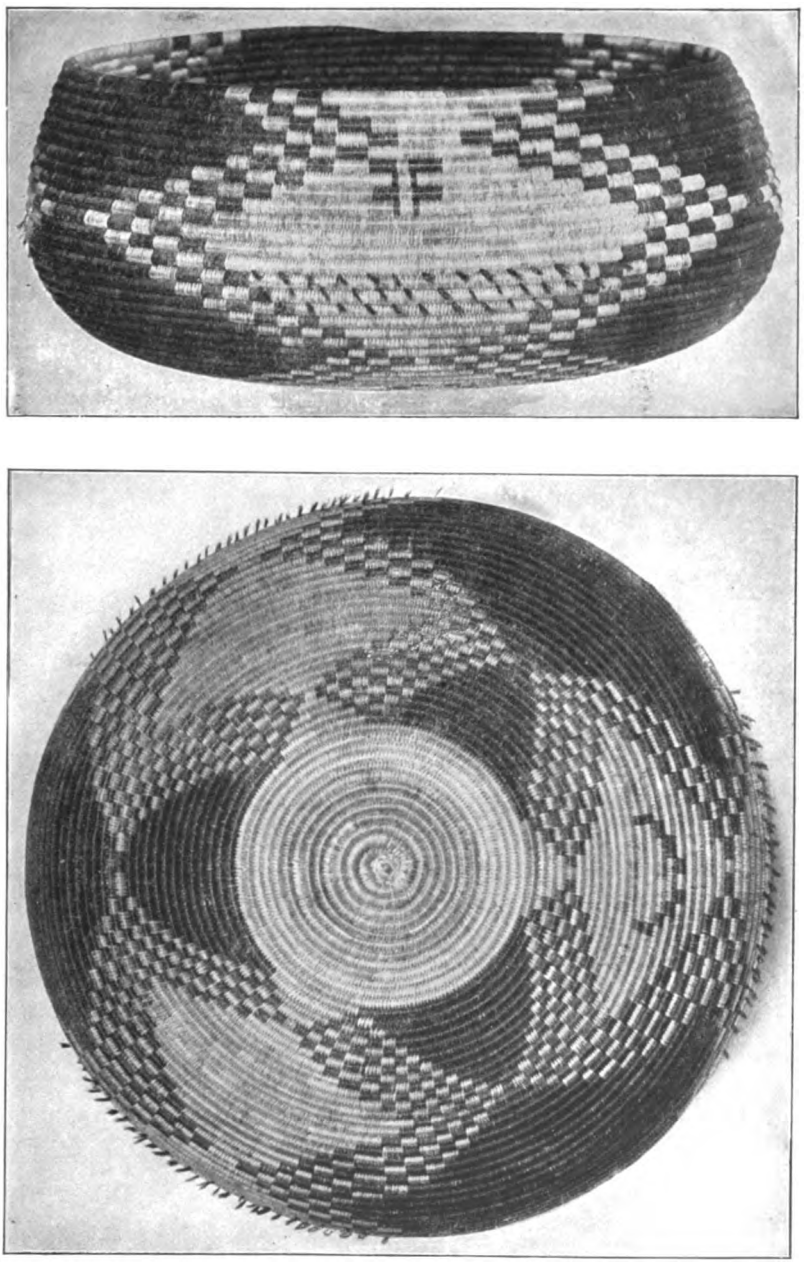


Plate 29. See page 98

FINE COILED BASKET WITH BAM SHI BU, OR THREE-ROD, FOUNDATION, POMO INDIANS, CALIFORNIA

Collection of C. P. Wilcomb

wife of Ned Dunson (Indian), then living at Santa Rosa Creek, Sonoma County, California. She belonged to the Tsar walo division of the Pomos. Diameter of the basket, 8⅜ inches. Collected by J. P. Stanley.

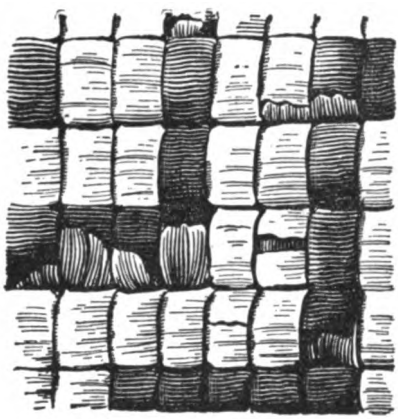


FIG. 53.
IMBRICATED COIL-WORK, CALLED KLIKITAT.

H. *Splint foundation.*—In basketry of this type the foundation consists of a number of longer or shorter splints massed together and sewed, the stitches passing under one or more of the splints in the coil beneath (fig. 51). In the Pomo language it is called Chilo, but it has no standing in that tribe. In the Great Interior Basin, where the pliant material of the California tribes is wanting, only the outer and younger portion of the stem will do for sewing. The interior parts in such examples are made up into the foundation. All such ware is rude, and the sewing frequently passes through instead of around the stitches below. In the Klikitat basketry the pieces of spruce or cedar root not used for sewing-material are also worked into the foundation (see fig. 41 H).

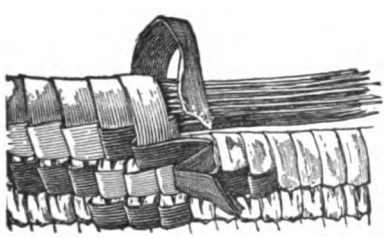


FIG. 54.
IMBRICATED BASKETRY DETAIL.
Thompson River.
After James Teit.

In a small area on Fraser River, in southwestern Canada, on the upper waters of the Columbia, and in many Salishan tribes of northwestern Washington, basketry, called imbricated, is made. The foundation, as said, is in cedar or spruce-

root, while the sewing is done with the outer and tough portion of the root; the stitches pass over the upper bundle of splints and are locked with those underneath. On the outside of these baskets is a form of technic which also constitutes the ornamentation. It is not something added, or overlaid, or sewed on, but is a part of the texture effected in the progress of the manufacture (see fig. 52).

The method of adding this ornamentation in strips of cherry bark, cedar bast, and grass stems, dyed with Oregon grape, is unique, and on this account I have applied the term "imbricated" to the style of weave here shown. (See fig. 53.)

The strip of coloured bark or grass is laid down and caught under a passing stitch; before another stitch is taken, this one is bent forward to cover the last stitch, doubled on itself so as to be underneath the next stitch, and so with each one it is bent backward and forward so that the sewing is entirely concealed, forming a sort of "knife-plaiting."

In some of the finer old baskets in the National Museum, collected over sixty years ago, the entire surface is covered with work of this kind, the strips not being over an eighth of an inch wide. James Teit describes and illustrates this type of weaving among the Thompson River Indians of British Columbia, who are Salishan. The body of the basket is in the root of *Thuja plicata*, and the ornamentation in strips of *Elymus triticoides* and *Prunus demissa*. (See fig. 54.)

Imbrication is one of the most restricted of technical processes. Eells says that some women in every tribe on Puget Sound could produce the stitch, and he names the Puyallups, Twanas, Snohomish, Clallam, Makah, Skagit, Cowlitz, Chehalis, Niskwalli, and Squaxin. It doubtless originated here. It is the native art of the Klikitats, Yakimas, and Spokans. The Thompson and Fraser River Indians have long known the art. (See Plates 68, 74–79, 156–167.)

Fig. 55 is a square inch from the bottom of a Fraser River imbricated coiled basket. It illustrates several important

features in the basketmaker's art. In the first place, the Indians of this area did not know how to make a beginning of the bottom of a rectangular basket with coiled work, so a block was inserted or foundation strips were laid parallel and were whipped together after the manner of coiled work. This figure also shows how the splitting of stitches before mentioned in sewing may have at first been accidental, the basketmaker having in mind only the purpose of placing the stitches in vertical rows. From this unintentional furcation of the stitches comes the purposeful splitting, the forked stitches being made alike and uniform. Thus, out of a careless habit has come one of the beautiful ornamentations in coiled basketry. A third purpose in this figure is to show, perhaps, the initial step in imbricated work. Indeed, this form of overlaying is seen on many examples of it. A straw of squaw-grass (*Xerophyllum tenax*) is inclosed under a stitch; it is then turned back; a second stitch is made and the strip of grass laid over it. Thus, over the surface there is an alternation of exposed and concealed stitches by means of this material. This is elsewhere called "beading."

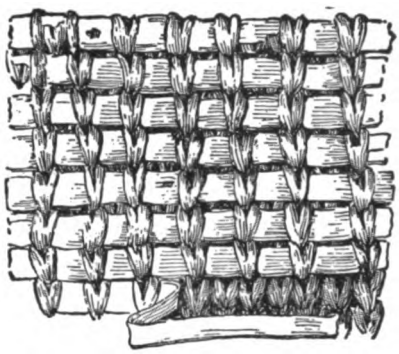


FIG. 55.
OVERLAYING IN COILED WORK.

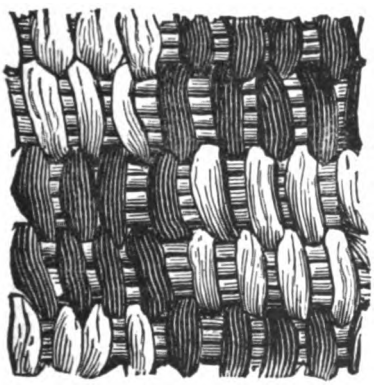


FIG. 56.
FOUNDATION OF STRAWS IN COILED WORK.

I. *Grass-coil foundation.*—The foundation is a bunch of

grass or rush stems, or small midribs from palm leaves, or shredded yucca. The effect in all such ware is good, for the reason that the maker has perfect control of her material. Excellent examples of this kind are to be seen in the southwestern portions of the United States, among the Pueblos and Missions, and in northern Africa. The sewing may be done with split stems of hard wood, willow, rhus, and the like, or, as in the case of the Mission baskets in southern California, of the stems of rushes (*Juncus acutus*) or stiff grass (*Epicampes rigens*). (See fig. 56, and the cross-section given in fig. 41 I.) In the larger granary baskets of the southwest a bundle of straws furnishes the foundation, while the sewing is done with broad strips of tough bark, as in fig. 57.

FIG. 57.
COIL WITH OPEN SEWING INCLOSING PARTS OF FOUNDATION.

Plate 30 shows specimens of Hopi coiled plaques on shredded foundation made up of the harder parts of the yucca split and rolled into a bundle. The sewing is with the tough, leafy portion, and passes simply under the coil in preparation, the stitches interlocking. Between the refined type of coiled work of this class and the old-fashioned straw beehive or the Mohave granary is a long distance. These thick Hopi plaques have their nearest resemblance in the Moorish basketry of

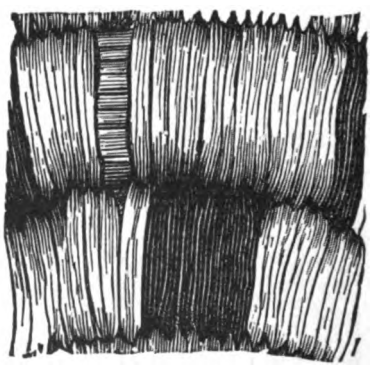


FIG. 58.
FOUNDATION OF GRASS OR SHREDDED MATERIALS.

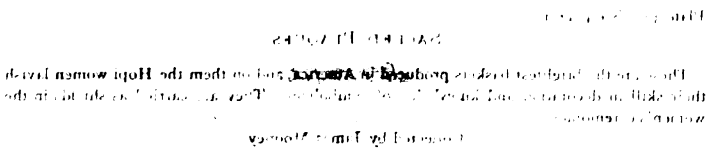
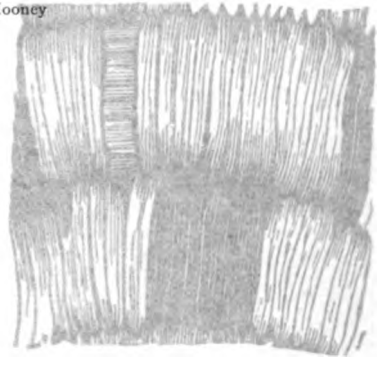


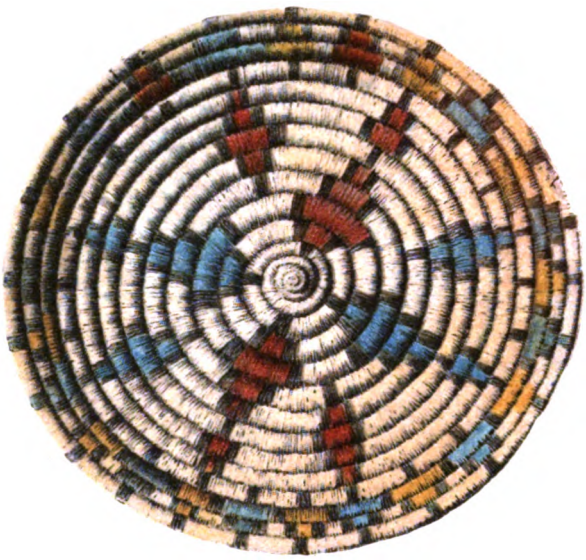
Plate 30. See page 102

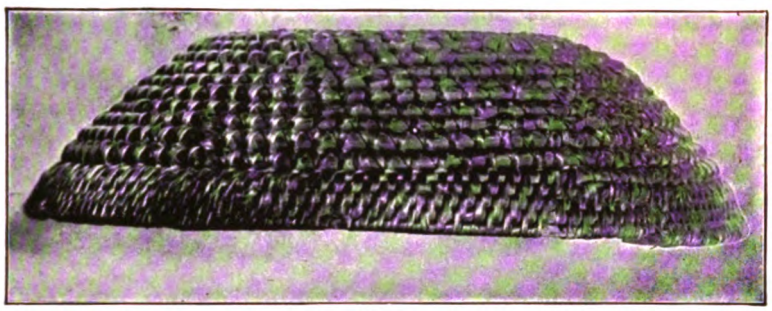
Sacred Plaques

These are the brightest baskets produced in America, and on them the Hopi women lavish their skill in decoration and knowledge of symbolism. They are carried as shields in the women's ceremonies.

Collected by James Mooney







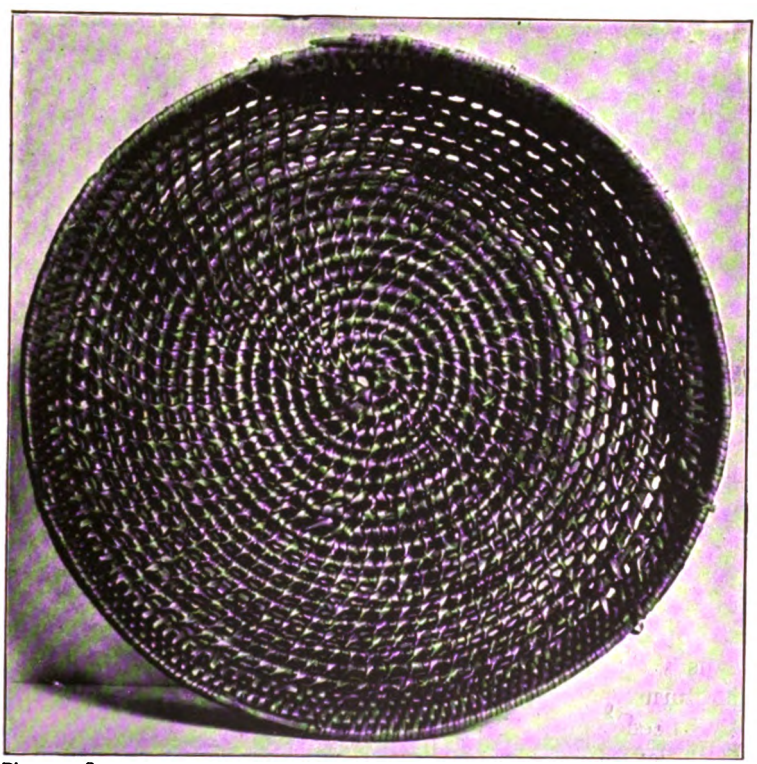


Plate 31. See page 103

COILED SIFTER, IN WHICH EACH STITCH MAKES A TURN ABOUT ITSELF BETWEEN RODS. CAVE IN UTAH

Collection of Am. Mus. of Nat. Hist., N. Y.

North Africa, and leave the question on the mind whether from long contact the Hopi themselves may not have gotten a suggestion therefrom. These specimens are Cat. Nos. 166,856 and 166,858 in the United States National Museum, and were collected by James Mooney. (See also fig. 58.)

K. *Fuegian coiled basketry.*—In this ware the foundation is slight, consisting of one or more rushes; the sewing is in

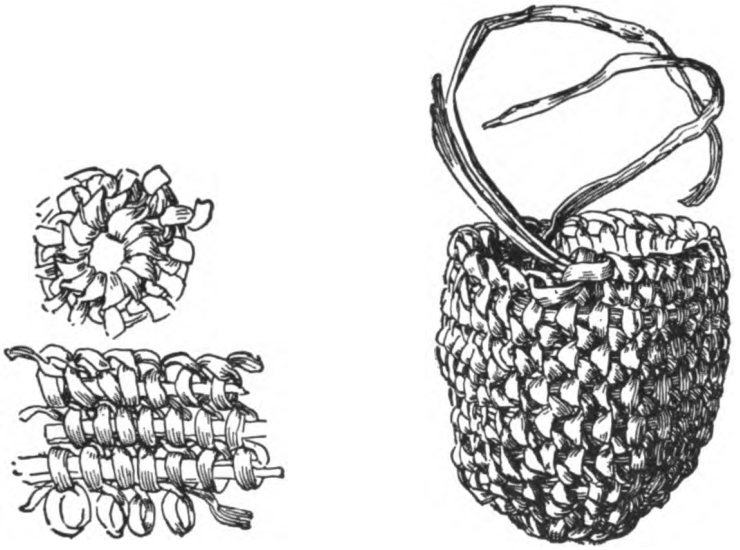


FIG. 59.
FUEGIAN COILED BASKET, AND DETAILS.

buttonhole stitch or half hitches, with rush stems interlocking. The resemblance of this to Asiatic types on the Pacific is most striking. (See fig. 59.)

Plate 31 is one of the most interesting specimens of basketry found in America, because in its structure it practically imitates the specimens just illustrated from the Strait of Magellan. It is described by George H. Pepper in Guide Leaflet No. 6 of the American Museum of Natural History. It is called a "sifter," and was found among the relics of the ancient basketmakers of southeastern Utah. The outer rows of coiling belong to the single-stick variety. On the

rest of the surface the binding material in passing around the foundation rods makes a whole turn on itself between them. The basket is 9½ inches in diameter and 2 inches deep.

Water-Tight Basketry

Basketry is rendered water-tight by closeness of texture and by daubing with pitch or asphaltum. Both twined and coiled ware are useful for the latter purpose. It is said of the mother of Moses that she "took for him an ark [a boat-shaped basket] of bulrushes and daubed it with slime and with pitch and put the child therein, and she laid it in the flags by the river's brink." (Exodus ii, 3.) Now, the Egyptians and other Hamites of our day make coiled basketry of type fig. 41 I—that is, with a foundation of shredded material sewed with finely split palm leaf. The foundation is quite thick, so that the ware is strikingly like the Hopi plaques of the Middle Mesa. There is no reason for believing that the ancient ware differed from the modern. In the Interior Basin, also, baskets are used for pottery by tribes that are not sedentary. (See Plate 32.)

Major J. W. Powell, during his topographical and geological survey of the valley of the Colorado River of the West, in company with Professor A. H. Thompson, made a collection of water-tight basketwork from the Paiute Indians (Shoshonean family) in southern Utah, and additions have been made by Dr. Walter Hough and others. Both coiled and twined work are found in great varieties. Plate 32 represents the varieties of these water-tight carrying-jugs or bottles. Fig. 1 of the plate, Cat. No. 11,882, is a Tsai a wats in twined weaving, the pattern being twilled work. Lugs on the side support the broad, soft, buckskin band. The pitch is evenly laid on, just revealing the texture beneath. Height, 7½ inches.

Fig. 2, Cat. No. 10,760, is a globose jar in coiled weaving, carelessly done on a splint foundation, as among the Utes.

Height, 7½ inches. There are no lugs on the outside, so this piece would be a pitcher rather than a canteen.

Fig. 3, Cat. No. 10,758, is a Tsai a wats of squat form in single-rod coiled weaving, with three lugs at equal distances around the shoulder for carrying. Height, 4¾ inches.

Figs. 4 and 5, Cat. Nos. 213,101–2, in the United States National Museum, are small canteens, collected from the Havasupai Indians, in Cataract Canyon, by Dr. Walter Hough. They are precisely the same in structure as the foregoing, though the Havasupai are of the Yuman family, while the Utes are Shoshonean. Height, 7½ inches and 8½ inches.

Fig. 6, Cat. No. 211,020, U.S.N.M., is a Paiute water-jar for carrying, from the collection of Captain Carr, United States Army. The foundation is of splints, and the pitch is carefully restricted to the inside. Horsehair lugs support the headband of old leather. Height, 9 inches.

Fig. 7, Cat. No. 11,880, U.S.N.M., is an excellent specimen of twined work in twill, with single rows of three-ply twine, and the neck in openwork. In many examples like the one here shown the melted pitch or asphaltum is poured inside and whirled around until the surface is covered. Height, 9 inches. The rope handle gives the appearance of a pitcher.

Fig. 8, Cat. No. 10,759, U.S.N.M., is pear-shaped, and has wooden lugs upon the sides for the carrying-bands. It is twined and twilled weaving and thoroughly overloaded with pitch. The rounded bottom serves to keep the bottle erect. Height, 8½ inches.

Plate 33 is a water-jar of the White Mountain Apaches, Cat. No. 213,278, U.S.N.M., collected by Dr. Walter Hough. It is made in diagonal twined weaving and covered with pitch. Three lugs of wood attached to the sides are for the purpose of suspension and carrying. The height is 12 inches.

Borders on Basketry

Having studied the structural processes on the body of these textiles, it will now be in order to note how the work is

finished off. A glance at a lady's workbasket or a waste-paper basket shows how important such an examination must be. Both in woven and in twined ware many beautiful specimens will be seen whose edges differ not in the slightest degree from other portions of the basket. Indeed, the Tlinkit, the Pomo, and the Mission weavers all frequently affect the plain border on their ware, and certain kinds of plaques of the Hopi Indians, said to be the workmanship of unmarried women, leave the foundation exposed, and the work is suddenly brought to an end.

Another fact will surprise the student, namely, that technically the border is often in quite another class of weave. This grows, as will be seen, out of the exigencies of the case. A checker weaving, with the edges left open all around, would be a clumsy affair. Coiled work lends a hand in putting a finish on woven work; the latter, or an imitation of it, on the contrary, becomes an embellishment of the former. The drawings and the plates will explain more clearly than words the structure of borders. The motive in this inquiry should be to learn the steps or evolutionary processes through which the ingenious savage woman's mind has passed in this series of inventions to discover, if possible, a little truth about the relationship and communication among tribes in olden times, and to learn some new manipulations in an art now becoming popular. It is like the breaking out of an old hereditary complaint in the tips of the fingers. The borders will be studied in the following order: The finishing off in checkerwork, in wickerwork, in twilled work, in twined work, and in coiled work.

The first and simplest method of making borders is illustrated in examples collected among the Abenaki Indians of Canada belonging to the Algonquian family. The baskets are made of splints from the ash, formerly worked out with aboriginal tools (see fig. 60), but nowadays made by machinery. The foundation of the borders consists of three narrow

Plate 32. See page 104

WATER-TIGHT BASKET JARS IN TWINED AND COILED WEAVING

Collections of U. S. National Museum

1 2
3
4 5
6
7 8

hoops. Every alternate warp splint is cut off flush; the others are bent down over the middle hoop and pushed under the upper row of weaving, having first been pointed. Outside and inside of this middle hoop, and clasping the bends in the warp splints, are the other two hoops, the whole being bound securely together by a coiled sewing in splint. The specimen here figured is Cat. No. 206,390, U.S.N.M., made by Caroline Masta. Diameter, 5¼ inches; height, 3 inches.

The border of twilled work, when the weaving is finished, resembles closely the interlacing of a series of crossed warps. In matting made in this way the ends of the warp and of the weft are bent backward on one another and forced under the texture. In one example a twilled mat is finished out with wicker weaving, both sets of elements being straightened out for warp. (See fig. 12.) The margin is then finished off as if the whole mass had been in wicker weaving. The examples here shown was made recently by an Indian woman in the Zuñi pueblo, western New Mexico. (See fig. 61.) The material is stripped leaves of yucca, from which coarse mats, basket bowls, and trays are made. The mat is woven square, and a hoop of wood is provided for the border. The mat is forced down into it, the ends of the warp and weft cut off about an inch above the hoop. They are then bent down on the outside in groups of fours and held in place with one row of twined weaving, as shown in the accompanying drawing, giving both front and back view. The basket is the gift of Mr. G. B. Haggett. Diameter, 11 inches. Cat. No. 215,488, U.S.N.M.

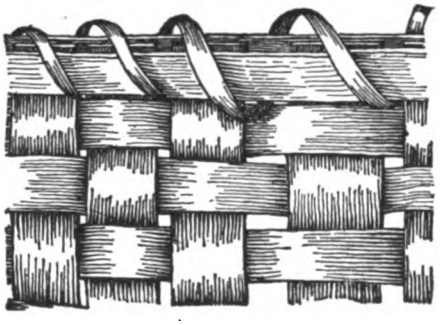


FIG. 60.
COILED BORDER ON CHECKER WEAVING
Cat. No. 206,390, U.S.N.M.

In the simplest forms of wickerwork the ends of the warp

are all cut off in uniform lengths and each bent down by the side of the next warp, or behind one warp and down beside the second warp, or is woven behind and in front of the other warp stems with greater or less intricacy, forming a rope pattern on the outside. So much of wicker basketry as originated with the Indians is very simple in the matter of finishing.

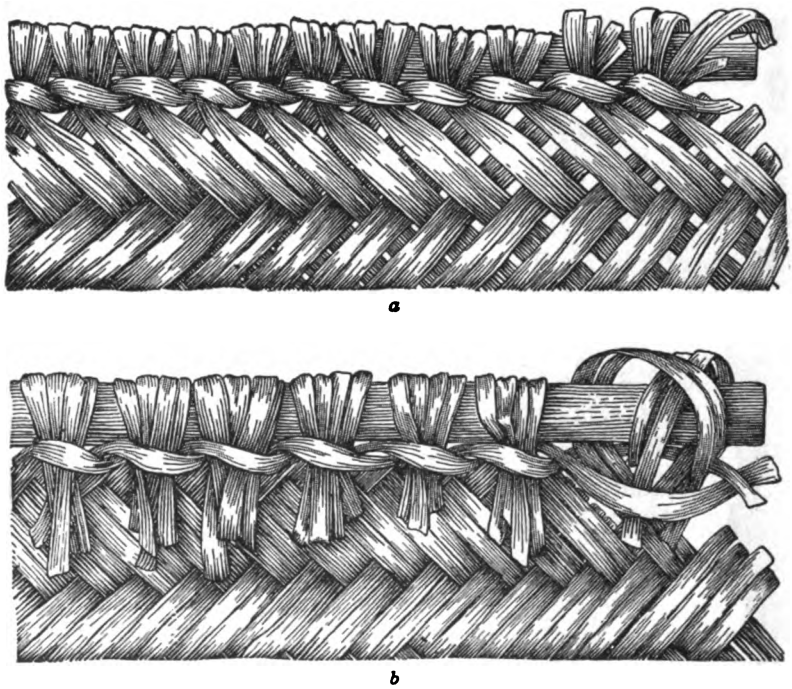


FIG. 61.
WEFT AND WARP FASTENED DOWN WITH TWINE.
(*a*, front; *b*, back.)
Cat. No. 215,488, U.S.N.M.

Cat. No. 215,487 shows how this sort of work is done. The basket is the work of the Zuñi Indians, New Mexico, and is the gift of Mr. G. B. Haggett. Diameter, 9½ inches. (See fig. 62.)

This variation of this type may be seen in the next figure. The warp stems are in pairs, and are bent in this case to the left at right angles and woven out and in among the next three

Plate 33. See page 105

APACHE WATER JAR

The Apache have never found any vessel to supersede their ancient tōs, which is indestructible, and imparts a sweet taste to the water from the pine gum used in pitching it.

Collected by Walter Hough

or four sets, returning to the starting-point. It is not altogether certain that this style of finishing the border was invented by the Indians, but they have adopted it. This draw-

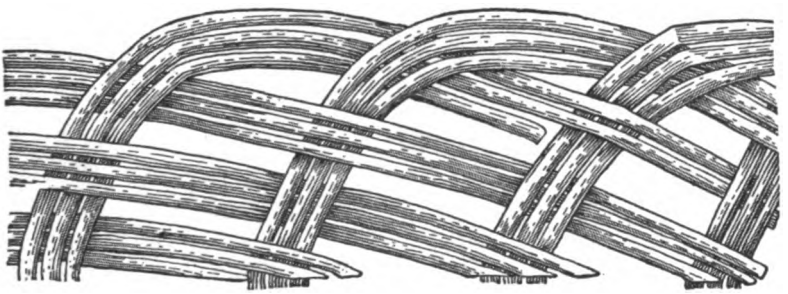


FIG. 62.
THREE-STRAND WARP BORDER IN WICKERWORK.

ing is made from specimens in the collection of G. Wharton James. (See fig. 63.)

In the next example the handle is a stiff splint of hickory, circular in shape. The wide hoop border shown in the drawing

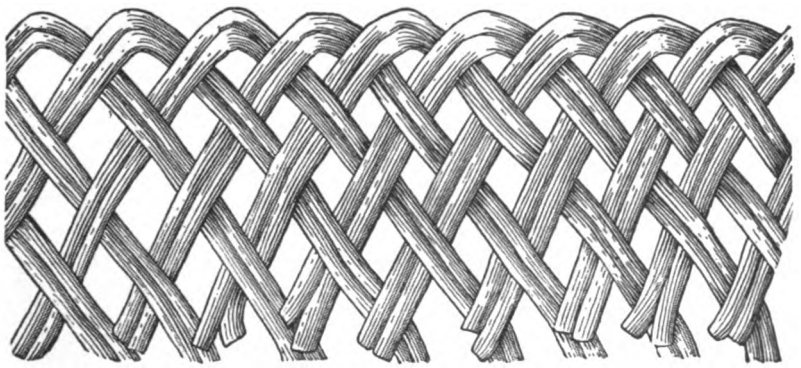


FIG. 63.
BORDER MADE BY WEAVING WARP RODS IN PAIRS.
Collected by G. Wharton James.

and the circular hoop are the framework from which the weave begins. All the smaller warp elements focus at the junction of these two. The widening is effected by the introduction of fresh warp elements as the work proceeds; the weft makes

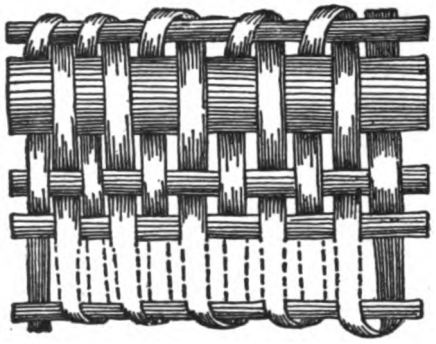


FIG. 64.
SINGLE-STRAND COILED BORDER.
Moravian Settlement, North Carolina.
Cat. No. 214,558, U.S.N.M. Collected by Carolyn G. Benjamin.

only a short excursion at the beginning around one or two warp stems, the hoop increasing in length as the work widens and additional warp elements are inserted. This specimen is Cat. No. 214,558, U.S.N.M., and was collected by Mrs. C. G. Benjamin from the Moravian Settlement, North Carolina. Diameter, 5¾ inches. (See fig. 64.)

The term "twined basketry" is applied to every variety whose warp elements are held together by twined weaving. The warp is either soft filament, or hardwood splints, or roots. The weft likewise may be yarn of flax, wool, or other very pliable material, or it may be rigid splints from roots, or tough young wood, such as osier, redbud, sumac, or the like. Such a variety of material will demand in the finishing off various kinds of borders. Lieutenant Emmons speaks of the border of the basket as its life, and says that, while a rent in the side or bottom of a wallet may be sewed with fresh root, the breaking of the edge suggests at once to the woman

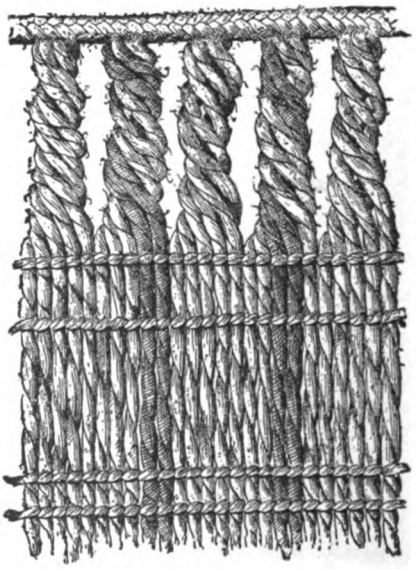


FIG. 65.
BRAIDED BORDER FROM WARP.
After W. H. Holmes.

the gathering of materials for a new basket. The great variety of borders in this type of weaving can be best understood by studying specimens. It will be interesting to begin this by comparing examples from two widely separated areas, namely, the caves of Kentucky and the distant islands of the Aleutian Chain, both in soft warp. (See Plate 143.)

Holmes* describes bags made from fiber found in a cave eight miles from Mammoth Cave, Kentucky. The largest is 34 inches across and 15 inches deep. The warp is of two-strand twine; an ornamental variety is given by introducing two larger cords of a different color at stated intervals. These warps are held in place by regular twined weaving at distances varying from a quarter of an inch to an inch apart. At the top, where the twined work finishes, the warp cords are brought together in groups of five and twisted into a rope for a short distance. They are then gathered into a continuous braid; the ends of those plaited in are cut off when the ends of a new set are taken up. This very elaborate form of border will also be found later on in Washington. (See fig. 65.)

The methods of finishing borders on twined work among the Salishan tribes are shown in the accompanying figure. The Quinaielt wallet (Cat. No. 127,843, U.S.N.M., collected by Charles Willoughby) has several noteworthy characteristics. The twined weft is vertical, woven over a frail warp. At the upper margin are outside strengthening rows of close-twined work. Finally, the two ends of each vertical weft element are brought together as one, bent backward behind the two preceding ones, then forward under a row of twined weaving, serving to hold them in place, the loose end showing on the inside. (See fig. 66.)

Turning now to twined weaving on hard foundation, it will be a matter of surprise that the Pomo Indians, who make some of the finest twined basketry in the world, take no pains

* Thirteenth Annual Report of the Bureau of Ethnology, 1896, p. 34, fig. 8.

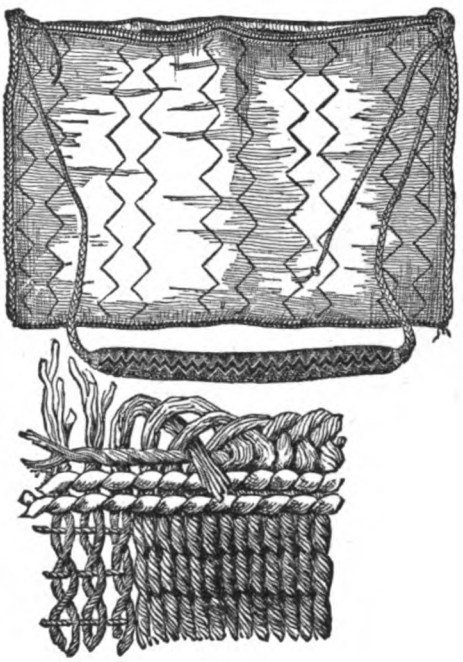


FIG. 66.
TWINED WALLET.
Quinaielt Indians, Washington.
Cat. No. 127,843. Collected by Charles Willoughby.

in finishing off the upper margin of many pieces. Cat. No. 165,659, U.S. N.M., is a basket of the Pomo Indians collected for the Bureau of Ethnology by H. W. Henshaw. Diameter, 11 inches. (See fig. 67 and Plate 19.)

The weaving is done when the material is wet and soft, and in drying the weft shrinks and binds itself to the warp, so that the basket actually wears out before it unravels. Granary baskets, mill-hoppers, mush-bowls, and other varieties in common use have this sort of margin. In the drawing here shown the weft is supposed to be untwisted, and the whole is enlarged in order to exhibit the texture. When complete, the warp is driven close together, and the little sticks of alder or willow forming the warp are left protruding.

In the following illustration the same principle obtains of making little or no change in the finishing, but the technic is three-

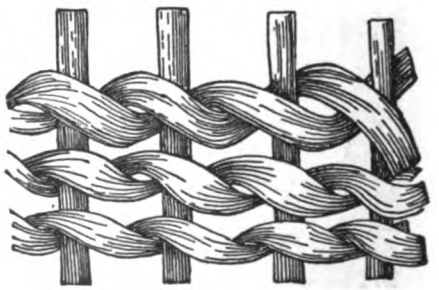


FIG. 67.
SINGLE-STRAND TWINED BORDER.
Pomo Indians.
Cat. No. 165,659, U.S.N.M. Collected by H. W Henshaw.

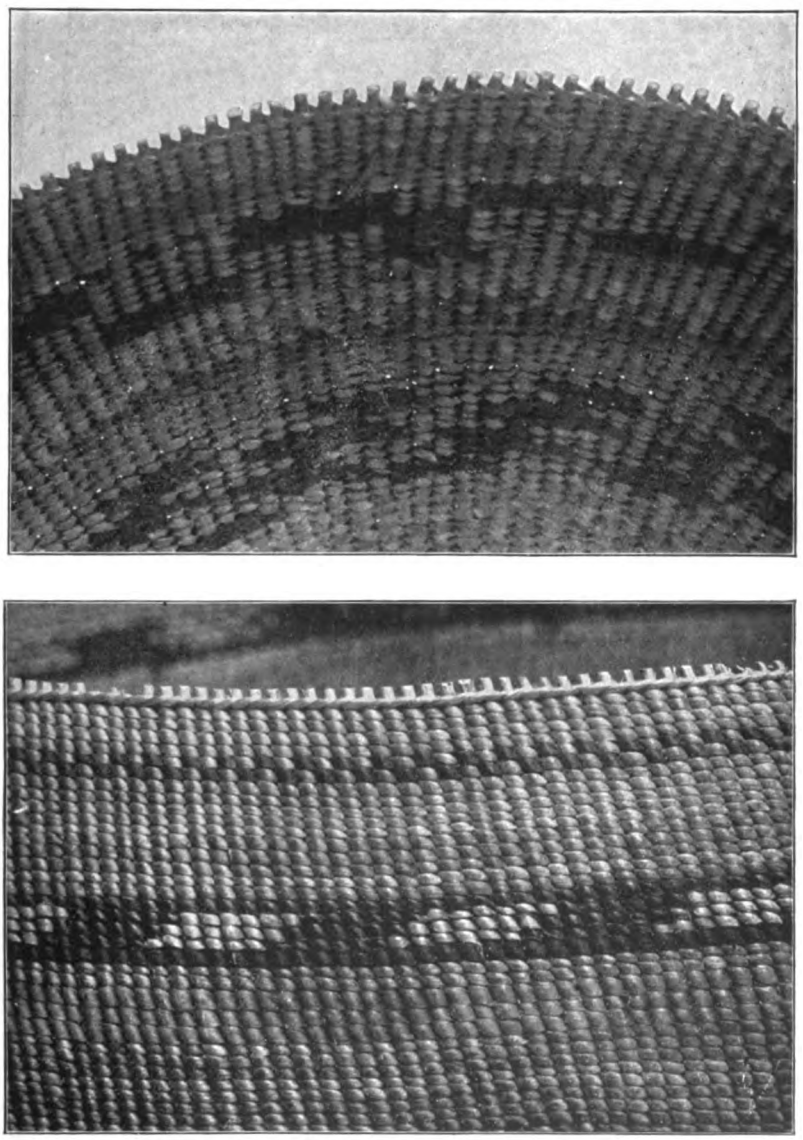


Plate 34. See page 113

THREE-STRAND BORDER ON POMO BASKET, VISIBLE ONLY ON THE OUTSIDE

Collections of U. S. National Museum

strand instead of two-strand. The figure represents a section of a meal-bowl of the Ceyal Pomo, Cat. No. 203,287, U.S.N.M., which was collected by Dr. J. W. Hudson. (See fig. 68.)

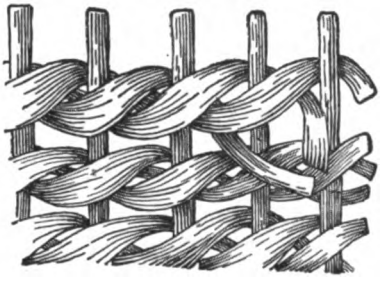


FIG. 68.
THREE-STRAND TWINED BORDER.
Cat. No. 203,287, U.S.N.M. Collected by J. W. Hudson.

Plate 34 makes evident the difference between the plain twined border and the three-strand border. In the upper figure the inside of the basket is exhibited and the effect is that of common two-strand twine, but in the lower figure the three-strand twine appears in a single row of weaving on the upper border. The cutting off of the margin is also shown. It is to be understood that the trimming of the ends of the warp stems is not done until all the weaving is entirely finished.

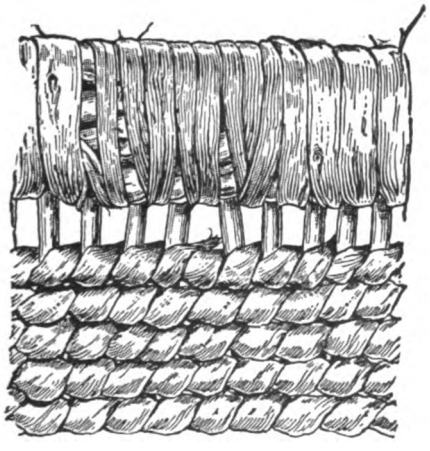


FIG. 69.
BORDER OF HUPA TWINED BASKET.

The Hupa Indians in some cases finish the borders of twined work by bending down the ends of the warp and wrapping or seizing them with splints of willow or other tough material. An inch of the border in a basket of the Ray collection in the United States National Museum is shown. (See fig. 69 and Plate 170.)

Another example of this woven and coiled work is shown. The basket (Cat. No. 68,491, U.S.N.M.) is the work of the Zuñi Indians of New Mexico. It will be seen that the last

row of weaving at the top is three-strand. The warp rods or stems extend a little way upward, then bend sharply to the left. They are then cut so that there will be always three of them included. The coil or seizing of splints holds them all firmly in place. The top of the basket measures 4¼ inches in diameter. (See fig. 70.)

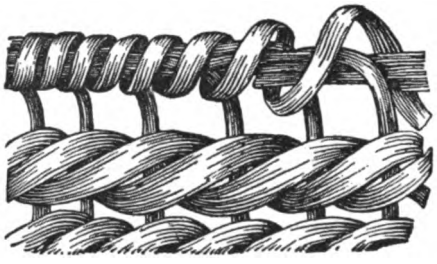


FIG 70.
WRAPPED WARP BORDER.
Zuñi, New Mexico.
Cat. No. 68,491, U.S.N.M. Collected by Frank H. Cushing.

The McCloud River Indians in Shasta County, California, cut off the warp flush and finish the border with what looks like plain twined weaving on the edge, but a regular half-knot is tied between each pair of warp stems.

Fig. 71 shows a border of Paiute Indian twined basket, in which the warp rods or stems are bent to the left at right angles and cut off after passing two or more stems, the object being

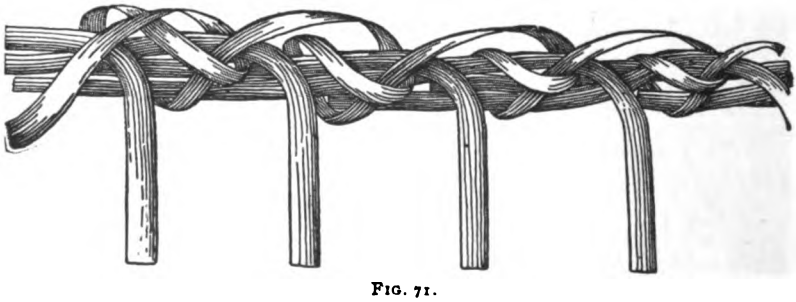


FIG. 71.
BORDER OF PAIUTE TWINED BASKET.

to have at least three ends in a bunch forming the foundation of the border. The uniting material is a long splint of willow or rhus, passing to the left, up and around the foundation in front of the standing part, and under the upper foundation stem backward, forward to begin another series. It is in fact

an application of the half-stitch or button-hole stitch. When these are drawn tight they form an effective border which on the upper margin has all the appearance of a four-ply braid. The basket itself is an example of twined weaving in twilled style, and shaped something like an immense strawberry.

This same process of imitating braid on the border of a basket by the ingenious wrapping of a single splint becomes much more complex in coiled basketry, as will be seen later in many figures.

The figure (Cat. No. 203,253, U.S.N.M.) shows a combination of the work just described and the twined work border

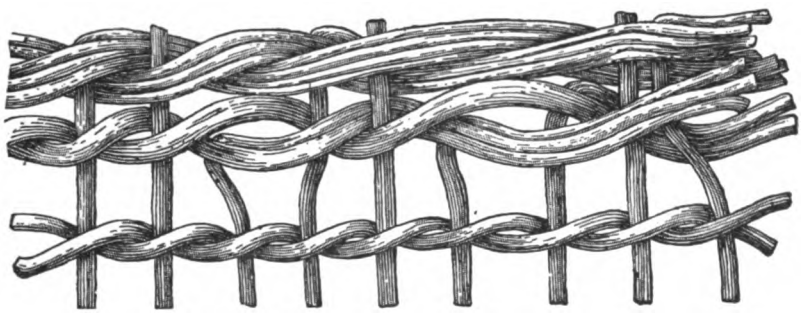


FIG. 72.
THREE-STRAND WARP BORDER.
Pomo Indians.
Cat. No. 203,253. Collected by J. W. Hudson.

formed by bending down the warp. The specimen is from the Pomo Indians. Collected by J. W. Hudson. Diameter, 14 inches; height, 10 inches. (Fig. 72.)

By far the greatest variety in the treatment of borders in twined basketry will be found among the Tlinkit Indians, southeastern Alaska, and the Haida Indians, on the Queen Charlotte Islands. Neither of these great families use coiled work, and they employ little of other types of weaving than the twined. The Tlinkits are more ornamental and use coloured grasses in their false embroidery, while the Haidas never employ such decorations, but excel in plain and diagonal twined work and in three-strand weaving. Lieutenant G. T.

Emmons, United States Navy,* has studied these people closely for many years, and the information regarding the borders of these tribes is derived from him.

According to this authority, fully nine-tenths of all the baskets used by the Tlinkits are of the open, cylindrical type, in which the border is called upon to sustain more than its proportion of the wear in use. Some tribes have always used

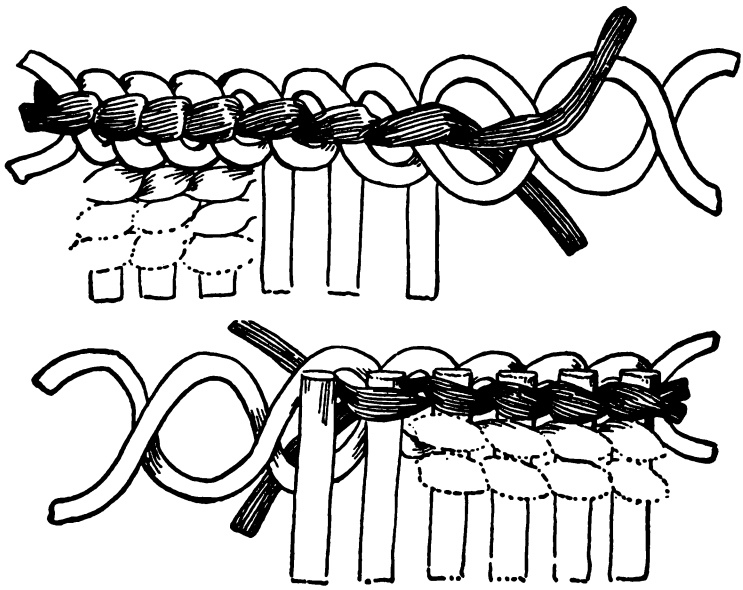


FIG. 73.
TWO-STRAND TWINE, ONLAID FOR BORDER.
Tlinkit Indians.

certain trimmings, plaitings, or braidings to the exclusion of others, and the work of different periods within tribal limits shows marked preferences. Two principal methods are employed in the finish of the border edge, (1) by trimming off the warp ends flush with the last spiral of weave (see Plate 44); and (2) by turning the warp over and fastening it down to the standing part by twined weaving or braiding. The first

* Basketry of the Tlingit Indians, Memoirs of the American Museum of Natural History, III, Pt. 3, 1903, pp. 229–277.

system is always used with covered baskets and generally with double baskets, where the two borders give protection to each other, with hats and mats, and generally with all types of baskets made for the tourist trade. The second method is employed in all open baskets made for use and in the finer varieties with double warp. When extreme nicety is required, the inner strand or layer of the double warp is cut off two lines of weave below the top, so that, when the outer strand is turned down on the standing half, the thickness of the border is not increased beyond that of the regular walls. But whether the warp is cut off flush or turned over, the last few spirals of weave are generally strengthened by additional twining, braiding, sennit, or embroidery. There are a few examples in the collection of the National Museum in which the turned reverted ends of warp stems are braided among themselves.

This braided warp is held together by rows of twined weaving.

1. The crudest border, or really want of border, consists in cutting off the ends of the warp even with the last spiral of two-strand weft. This is universally practised with the covered work-basket, and is often the finish of the smaller double basket. (See fig. 67.)

2. Border with the warp ends cut off flush, the one or more rows of three-strand twined woof around the edge adding strength to this part. (See fig. 68.)

3. In the third type of border a two-strand twine is laid vertically against the outside of the warp stems and held in place by another two-strand twine passing through the vertical twine and around the back of the warp stems. The vertical twine appears only on the outside of the basket. The horizontal twine is seen on the outside and the inside alike. (See fig. 73.)

4. In the fourth type of border a two-strand twine is ornamented on the outside with false embroidery, precisely as on the body. In some cases a narrow band of this style of weaving occurs at the upper margin and is decorative as well as useful.

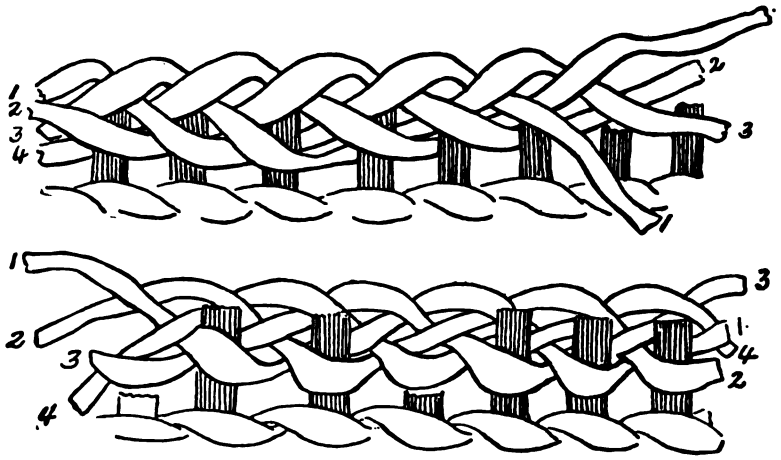


FIG. 74.
THREE-STRAND BRAID WOVEN IN FOR BORDER.
Tlinkit Indians.

5. The Haida and the Tlinkit truncated cone-like hat of root is finished at the border by cutting off the warp ends flush and weaving a common three-strand or four-strand braid around the warp, so that one part goes inside and the other two or three parts remain on the outside. This shows a rope-like ridge on the outside around the edge. (See fig. 74.)

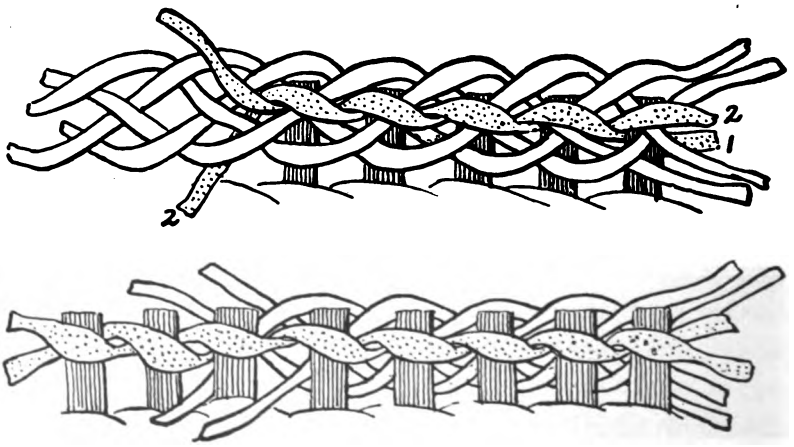


FIG. 75.
BORDER OF BRAID, ONLAID.
Tlinkit Indians.

6. Another style consists in sewing a braid or sennit on the outside of the warp by means of a two-strand twine passing through the first and around the second. These two styles of finishing hat-borders are in use by the Haida in basketry, and may have been borrowed from them. (See fig. 75.)

7. In all open baskets made for use where strength is of primary importance the warp ends are doubled over on the standing part of the next warp splint in the direction of the

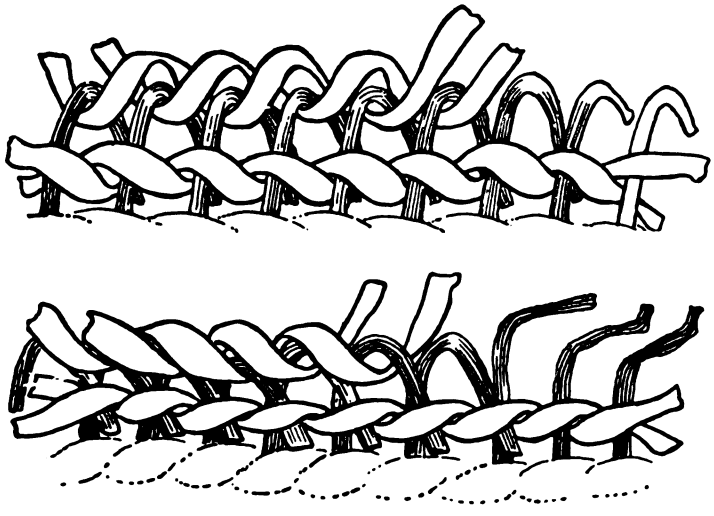


FIG. 76.
BORDER OF TURNED-DOWN WARP WITH TWO-STRAND TWINE.
Tlinkit Indians.

weave—that is, to the right—and twined down to it with the weft. This finish is found on the oldest pieces of Yakutat work. It is often strengthened by the overlaid embroidery in straw or root around the last few spirals of weave. A number of technical processes employed when the warp is cut off flush will be found also on the borders of specimens in which the warp is turned down.

8. With the turning down of the warp strands the three-strand woof twining is sometimes used in the place of the two-strand.

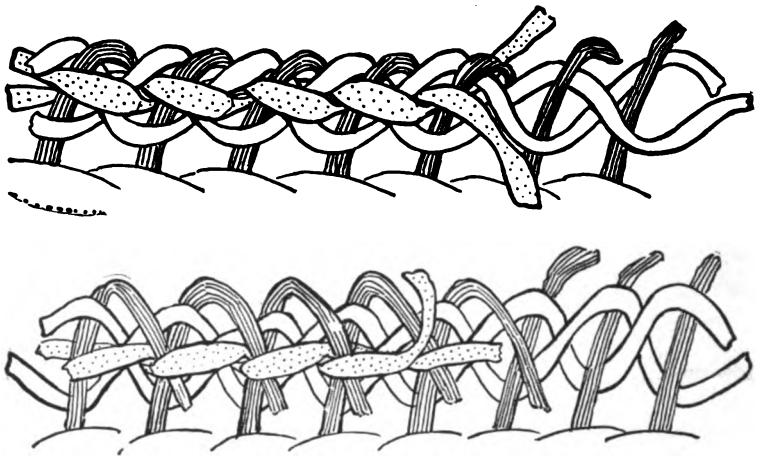


FIG. 77.
BORDER OF FOUR-STRAND BRAID, TURNED-DOWN WARP.
Tlinkit Indians.

9. A later finish, and one generally found on the shallow, basin-like basket used as a work basket in weaving and as a berry screener, consists of a turning down of the warp ends as described, and, in addition, weaving a two-strand twining

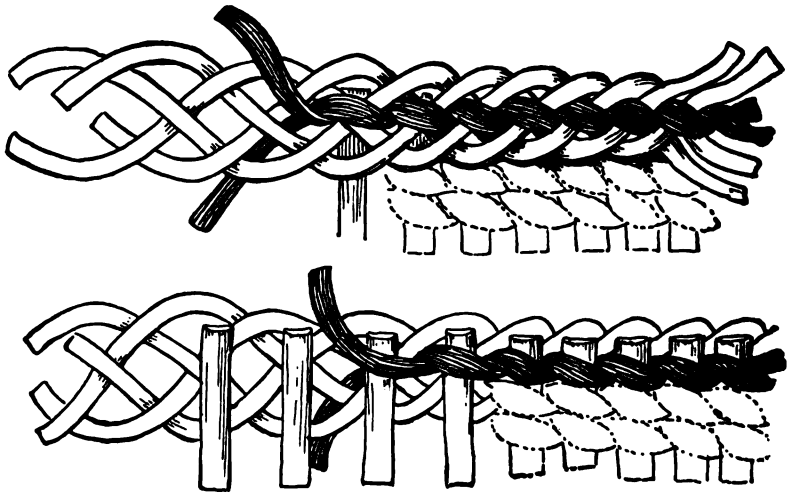


FIG. 78.
BORDER OF FOUR-STRAND BRAID ONLAID, WARP TURNED DOWN.
Tlinkit Indians.

over the bights, forming a rope-like twist over the outer edge, and thoroughly protecting the more exposed parts of the

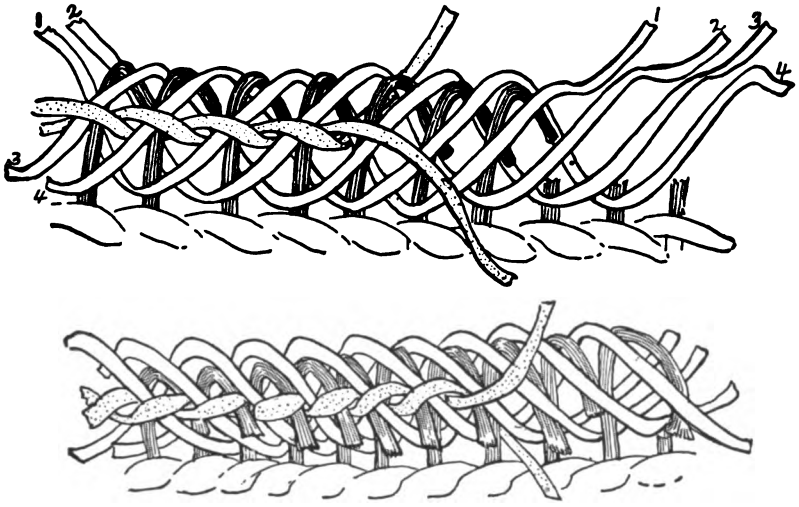


FIG. 79.
BORDER INCLOSING HOOP.
Tlinkit Indians.

warp. This character of finish occurs more among the Sitka, Hoonah, and Hootz ah tar tribes. The Chilkat never used it,

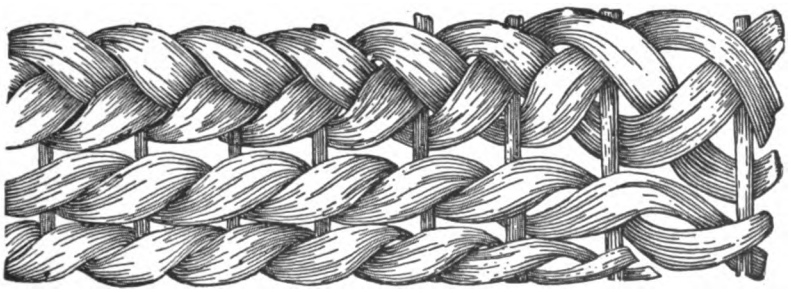


FIG. 80.
BORDER OF THREE-STRAND BRAID.
Tlinkit Indians.

and the Yakutat only in the case of the basketworker's basket. It is certainly of more recent date, although not of to-day. (See fig. 76.)

10. The most elaborate finish, peculiar to the Chilkat, used

to a degree by the Hooach, seldom found among the Sitka and Hootz ah tar, and practically unknown to the Yakutat, consists in two extra woof strands which, with the orig nal, go to form a regular flat sennit braided on the turned-down warp. This finish is also found on the finest and most elaborate ceremonial hats. (See fig. 77.)

11. The four-strand braid or sennit is attached to the outside of the border by a two-strand twined weaving. The middle strands of the four-strand braid are crossed each time behind the outer one of the two-strand weft (fig. 78), which also grasp the turned-down warp on the back.

12. The border of the oval covered basket differs radically from that of all others. Here the top of the body is rolled over on the outside and twined down all around, and sometimes this roll incloses a thick spruce hoop, which adds considerably to the strength and stiffness of the border. (See fig. 79.)

In all instances where the warp ends are turned over, the ends of the woof splints in finishing off the border are twisted and run through the bights of the two or three last warp strands.

Fig. 80 shows a border of a basket hat from the Tlinkit Indians, Alaska, also collected by Lieutenant Emmons. The border represents two rows of regular twined weaving, the finishing in three-strand braid (fig. 74). It will be noticed that in crossing each warp rod one of the three members of the braid passes behind the warp, the other two remaining in front. On the inner side, therefore, the appearance will be that of the ordinary twined work. Cat. No. 168,263, U.S.N.M.

Fig. 81 shows a form of border on the twined work of the Haida Indians in Queen Charlotte Islands, British Columbia, in which the warp stems are cut off flush. In this example four splints, or two rows of twined work, are combined into a braid, as will be seen in fig. 73, the two rows of twining becoming one row of braid. As the braiding proceeds, the weft splint on the inside is hooked over the end of the warp stem. In the

Plate 45 See page 121

OLD SALISH IMBRICATED BASKETS

Showing plain and sinuous coiled borders. Washington coast tribe type

Collected by J. H. Wilbur and Wilkes Exploring Expedition

drawing are shown also the plain-twined weaving and diagonal or twilled work by means of which figures are wrought on the surface of the hat.

In coiled basketry many specimens, often among the finest, as will be seen in the accompanying drawings, have in their borders the same structure as on the rest of the body. For each special type of coiled work there will be a variety of

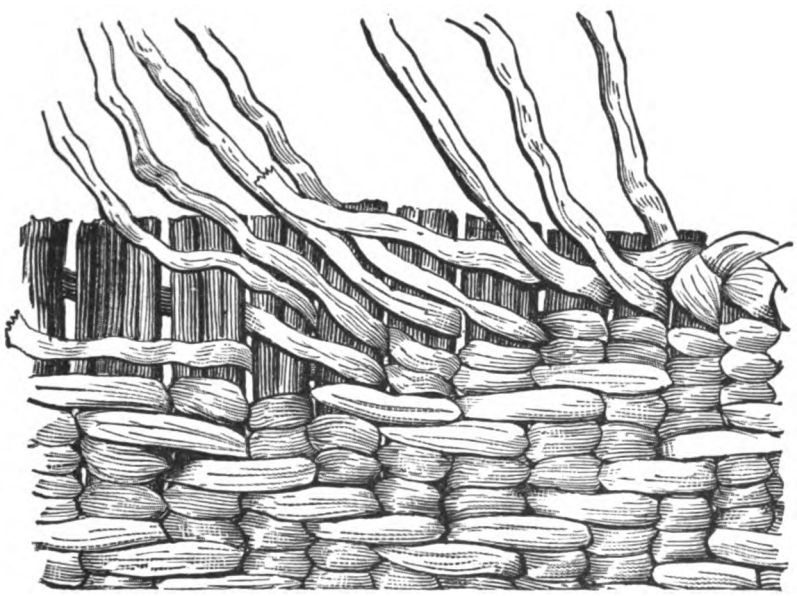


FIG. 81.
MIXED TWINED WORK.
Haida Indians, British Columbia.
Cat. No. 89,033, U.S.N.M. Collected by James G. Swan.

border. Frequently the coiled netting, of which hammocks and other weaves without foundation are examples, is finished off by simply stopping the work. The same would be true in all the varieties of foundation mentioned in the previous sections. In the present example the foundation consists of three rods or stems, not set in triangular fashion, as in the best Pomo coiled work, but in a vertical series. This makes the rows much wider and economises the sewing. But the

varieties of this type are as numerous as the tribes of Indians practising coiled weaving. (See fig. 82.)

Fig. 83 illustrates the same statement already made with reference to the so-called grasshopper basket (Plate 24). The drawing shows how, with a splint foundation, the sewing-material interlocks with the stitches underneath, taking up at the same time one or more splints.

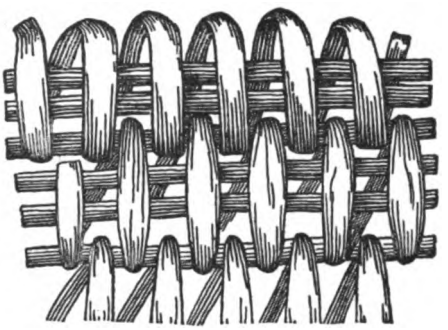


FIG. 82.
SIMPLE COIL BORDER.
Paiute Indians, Utah.
Cat. No. 14,688, U.S.N.M. Collected by J. W. Powell.

In Plate 23, illustrating bifurcated stitches on a basket in the McLeod collection, will be seen the simplest departure from the ordinary coiled sewing on the border. The stitches pass forward one space, through and backward a space, making a herring-bone effect on the upper edge of the basket.

Plate 35, upper figure, illustrates a simple type of border-work. The foundation is a bundle of splinters wrapped with splints of spruceroot and sewed on here and there in regular order to the coil underneath, being bent between the stitches so as to form a regular sinuous line. On the next round the row is straight, wrapped like the first, and is sewed to the top of the sinuous coil underneath. On the top of all is another row, the bends not being so high, the lower portion being sewed to the joint of the other two. The border forms a

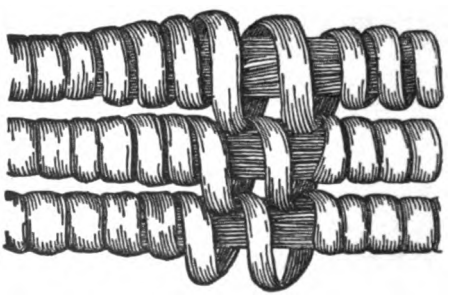


FIG. 83.
SIMPLE WRAPPED BORDER.

series of lenticular openings, with a bar across the long diameter. This method of ornamentation is not confined to one area, an Eskimo specimen from Davis Inlet, northern Labrador, collected by Lucien Turner, being made on substantially the same plan.

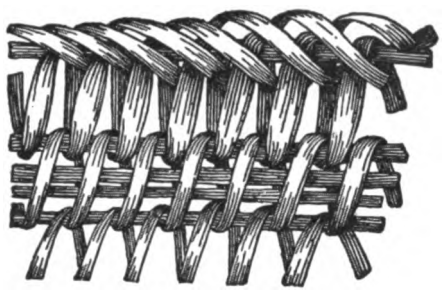


FIG. 84.
THREE-STRAND COILED BORDER.
Hopi, Arizona.

Fig. 84 is the border of a coiled basket, collected among the Hopi Indians by Victor Mindeleff, Cat. No. 84,596, U.S.N.M. It will be seen that the foundation of the coiled work on the body of the basket consists of three rods on the same perpendicular plane. The stitch passes over the three; catches under one of the previous coils, the stitches interlocking. In finishing off this work a single rod is used for the margin or border. It is sewed to the upper rod of the previous foundation in plain coiled work; but while this process is going on a series of three

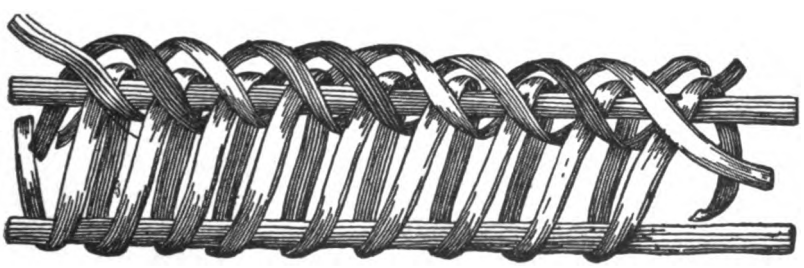


FIG. 85.
DETAIL OF FIG. 84.

splints are twined around both the foundation and the stitches of the border. When the whole is drawn tight it gives the appearance of a very elaborate double-braided work, looked at from the outside, and a continuous twined or rope-work on the upper margin. In order to make the style more compre-

hensible, a drawing from the border of Cat. No. 204,833 is introduced (fig. 85), in which the elements of the border twine are in different colours. The two examples just shown illustrate what was previously said about using twined work

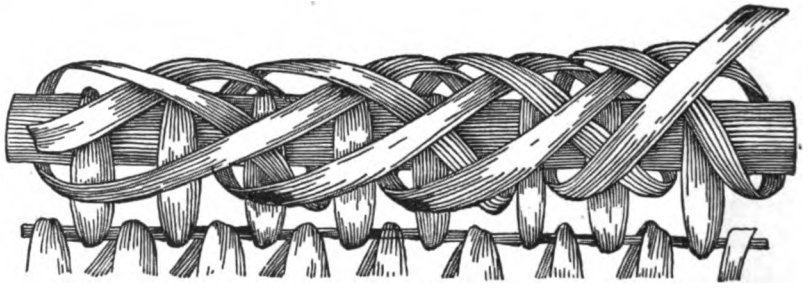


FIG. 86.
SINGLE-STRAND PLAITED BORDER.

for the borders of coiled weave, and the opposite among the Tlinkits.

Fig. 86 represents the border of a coiled basket of the Sia Indians, of New Mexico, Cat. No. 134,213, U.S.N.M., collected by Mrs. Matilda C. Stevenson. A hoop is used for the founda-

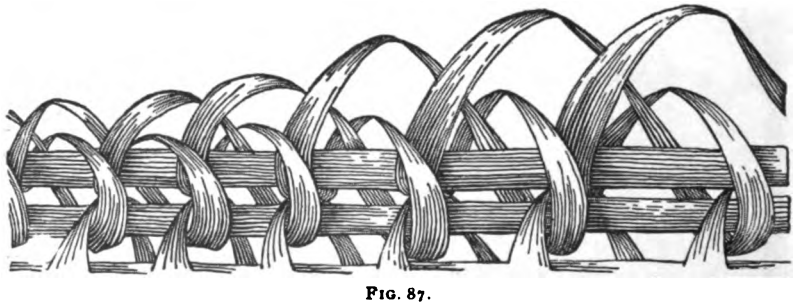


FIG. 87.
SINGLE-STRAND PLAITED BORDER.
Havasupai Indians, Arizona.
Cat. No. 213,259. Collected by Walter Hough.

tion of the border, and it is first made fast to the regular sewing underneath by means of a simple coiled splint on the outside of this. The ornamental border consists of an ordinary figure-of-eight wrapping, as in winding up a kite-string, going from left to right. A splint passes under the foundation rod toward

the front, and then forward five stitches over, behind, and under, back three stitches and under. The same process repeated gives the form of a braid on the outside. Finally, by the manipulation of a single pliable splint, effects are pro-

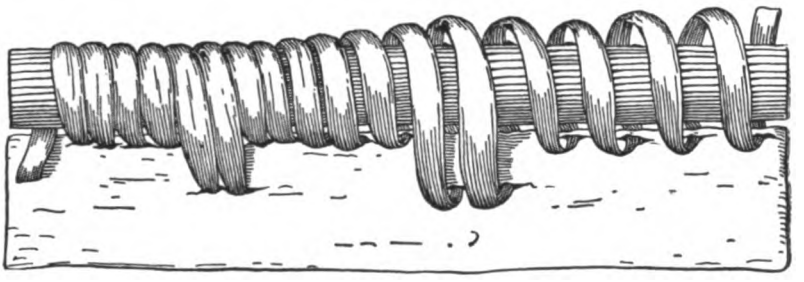


FIG. 88.
PLAIN COILED BORDER ON BARK VESSEL.
Cat. No. 217,750, U.S.N.M. Collected by I. C. Russell.

duced on the border which resemble three-ply or four-ply braid.

Fig. 87 shows the detail of border on a Havasupai (Yuman) basket, Cat. No. 213,259, U.S.N.M., collected by Dr. Walter

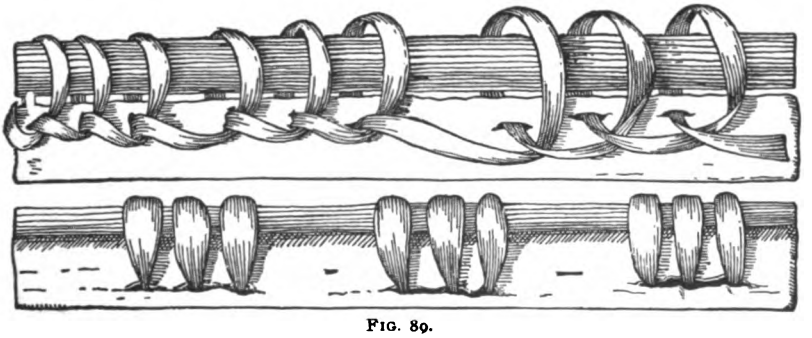


FIG. 89.
COIL AND KNOT BORDER ON BARK VESSEL.
Cat. No. 217,744, U.S.N.M. Collected by I. C. Russell.

Hough. It will be seen that two rows are used in the foundation of the border. The strip, or splint, passes under the upper backward, then around in front forward, and under both, then backward to repeat the process by a sort of figure-eight movement, passing from left to right. When the work

is done and driven home it has the appearance of regular plaiting. Fig. *b* shows both top- and side-view of the completed work.

The application of borderwork to other forms of receptacles may be studied here, since the processes are quite akin. In a large area of North America, bark of trees, with some leather, was so easily worked that very little trouble was taken in weaving baskets.

Fig. 88 represents the border of a birch-bark tray formed over a rod of willow, a very simple and effective but quite ornamental method of attachment. Five holes are bored or cut through the bark near the upper border. Two holes are then made half an inch from the border, and these series are repeated all the way around. The sewing passes around the rod and through the hole in a simple coil, but the effect of the shallow and the deep stitching is quite pleasing. The sewing is done with tough splints from the root of the spruce. The specimen here figured is from the Upper Yukon River, Cat. No. 217,750, U.S.N.M., collected by I. C. Russell.

Fig. 89 is the border of a birch-bark tray from the Tinné Indians, Central Alaska, collected by I. C. Russell, Cat. No. 217,744, U.S.N.M. Three slits were cut through the bark near the margin; after an interval of some distance three others, and so on around the entire border. A willow rod serves for the strengthening element, and the spruceroot is attached by a series of half-hitches or button-hole stitches. On the inside the effect is a combination of coiled and twined weaving, and on the outside only the vertical stitches of the coil are seen.

Fig. 90 represents a border of a Yukon River, Alaska, birch tray. It consists of the alternate use of plain coil around a strengthening rod and three stitches, passing down and under a rod on the inside, crossing the standing part to the right through an opening or slit cut in the bark, and up to the beginning. There are three of these half-hitches, as they

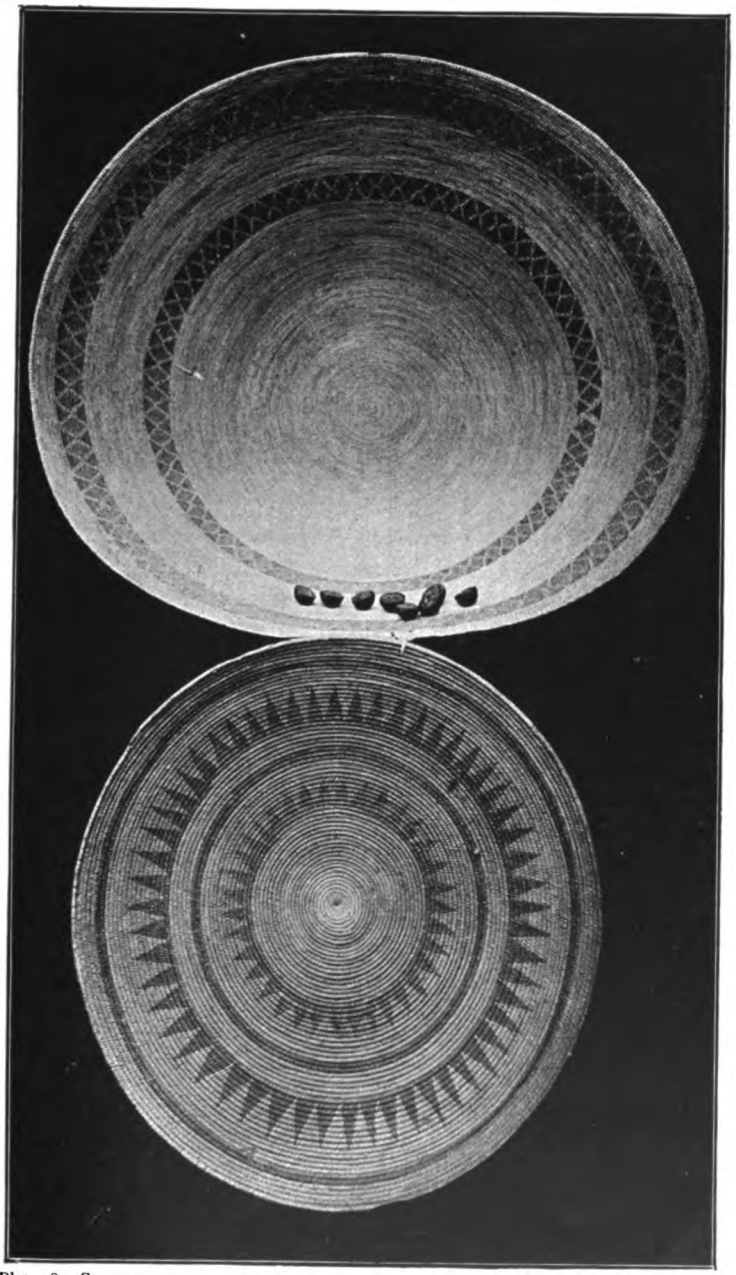


Plate 38. See page 137

GAMBLING PLAQUES FROM TULARE AND MADERA COUNTIES, CALIFORNIA

Collection of E. L. McLeod

might be called, and then five wraps around the upper rod. From this point the process is renewed.

Fig. 91 is a border of birch-bark tray from the Upper Yukon River, collected by I. C. Russell. On the upper edge

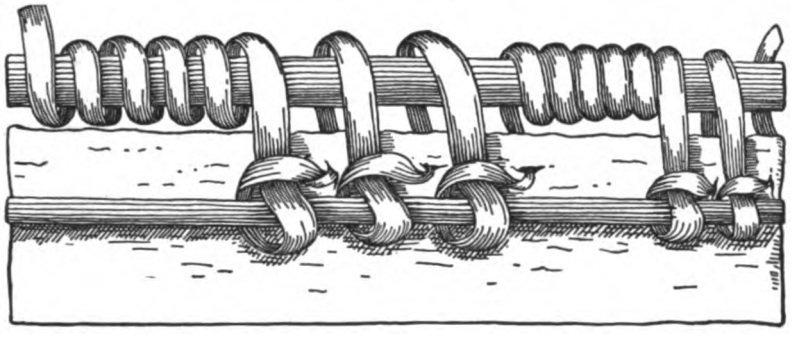


FIG. 90.
PLAIN COILED BORDER ON BARK VESSEL.

a rod is used for strengthening. It is attached to the margin of bark by means of splint of spruceroot. The drawing shows the front and back of the method of holding the root and bark together. From the back the splint passes

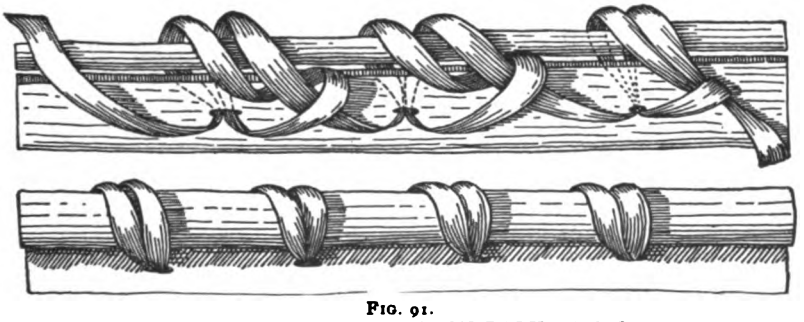


FIG. 91.
COIL AND KNOT BORDER ON BARK VESSEL.
Cat. No. 217,247, U.S.N.M. Collected by I. C. Russell.

from the hole in the bark obliquely over the rod, down, forward through the bark, backward and behind the standing part, over the rod, down and through the same hole, to start another knot. Practically, then, it is a series of single knots, as is shown in the upper openwork drawing. The Indians

who make these birch baskets are called Tinné, or Déné. They live in Central Alaska and belong to the Athapascan family. The specimen is Cat. No. 217,247, U.S.N.M.

The ordinary checker and other woven mats are fastened off in the same manner as the baskets.

An interesting and intricate border is made by the Chilkat Indians on their ceremonial blankets. It consists of a number of long strings of mountain goat's wool and cedar bast held together by a few rows of twined weaving at the middle. This is then doubled and sewed to the margin, the ends forming the fringe. (See Plate 148.)

Plate 39. See page 137 CEREMONIAL BASKETS OF THE NAVAHO, ARIZONA, SHOWING SHALLOW DISH FORMS

Fred Harvey Collection

CHAPTER IV

Ornamentation on Basketry

There's magic in the web of it:
A sibyl that had numbered in the world
The sun to make two hundred compasses,
In her prophetic fury sewed the work.
—Othello, III. 4.

Ornamentation in and on basketry is to be studied with three teachers or guides—the technician, the artist, and the folklorist. With the first-named are learned the varied materials as to colour and texture, the technical elements and their forms, and the methods of assembling them. The artist will show how these elements, on the one hand, open possibilities for esthetic effects, and how, on the other hand, the stitches and decussations handicap attempts at free-hand drawing. The folklorist examines the pictography, the totemism, the lore and mythology of the ornamentation, with a view of putting the student into intellectual and spiritual relationship with the basketmaker. Without her, basket-making would be merely a trade or calling, and the art student would be utterly helpless in detecting the alphabet of design. This phase of the subject will be elaborated in the chapter on symbolism.

Great help in this investigation would be derived from a visit to the humble artist to watch the processes through which the fine effects have been elaborated. To this inquiry special attention will here be given. It should be added in passing that in producing her effects the basketmaker must be fully equipped for her work before the first stitch or check is attempted. The painter, the potter, and the sculptor may add finishing touches or make corrections after the work is done,

but the basketmaker is like the musician—every detail in the production must be attended to correctly at the time. There is no chance to go back and remedy defects. Decoration on basketry is studied under the following heads:

A. Form and structure.

B. Ornamentation through colour.

Form and colour may be studied (1) on the basket as a whole; (2) on the minutest structural elements; and (3) in the designs upon the surface. These will be taken up in order and treated in their relation to the sense of the beautiful, present in the humble Indian woman's mind as well as in those more refined. Growth, progress from pure naturalism to greater and greater artificiality, may be observed here quite as marked as in other activities. To illustrate what is here said by way of introduction, Plate 36 represents a coiled basket of the Mission Indians in the collection of G. Wharton James. The noteworthy characteristics of this basket-bowl are the effects produced by variety in designs and colour in shades, as well as by symmetry of outline. The sharp contrast seen in the designs are due not to modern dyes, but to a skilful use of Nature's colours. Under the descriptions of materials, attention was called to the variety of natural pigmentation in the stems and roots of the plants used in the construction of the Mission work. The center of the specimen is in rectangles, the colours of which alternate between white and dark brown. The center zone is made up in straw-colour, white, and black; the third or outer zone in natural shades of the stem—white, brown, and black—with here and there spots of brown introduced into the straw-coloured sewing. The outer edge is in brown and white. Anciently, the Mission baskets were not nearly so gaudy-looking, but among the frequent transformations in artistic forms and colours this example illustrates progress in the adoption of really beautiful motives of a high order.

The elaboration of decoration in form first, and then of colour, will now be taken up more minutely. The esthetic

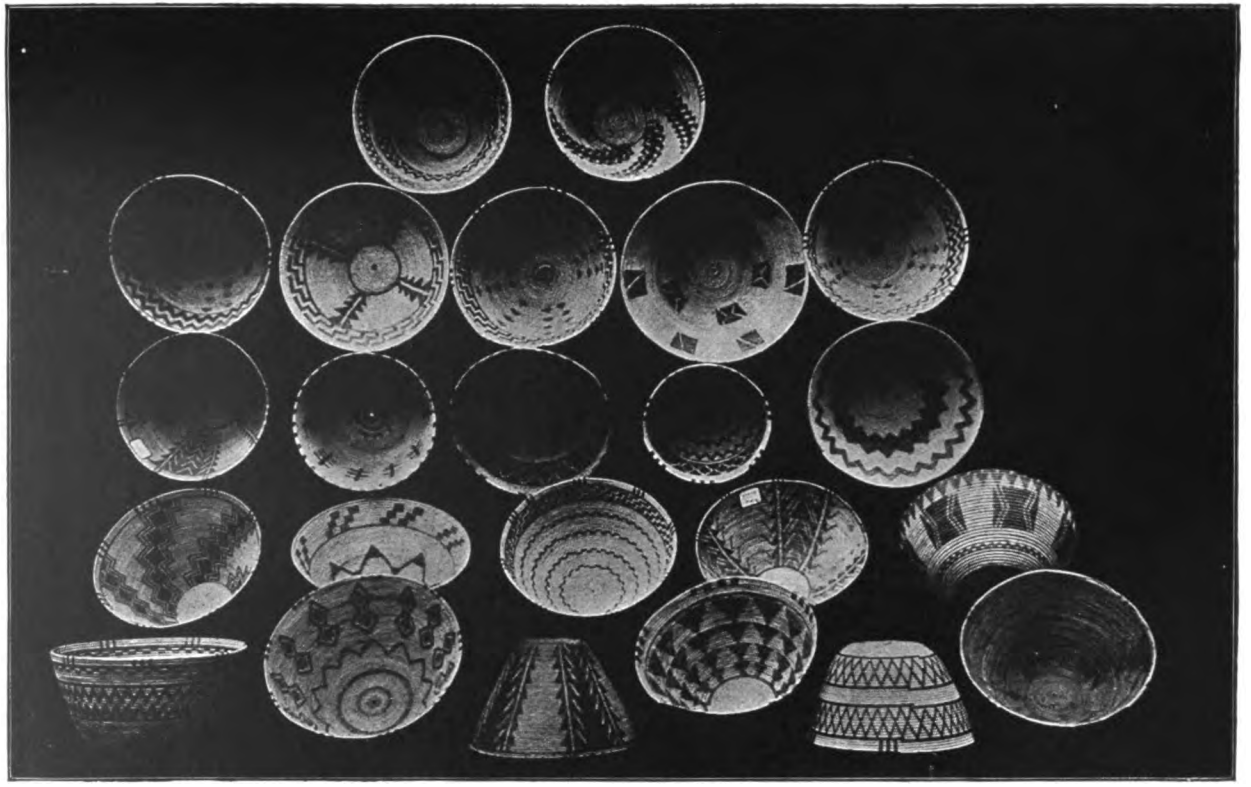


Plate 40. See page 138

HATS AND MUSH BOWLS IN COILED WARE, FROM KERN COUNTY, CALIFORNIA, TO SHOW METHODS OF DEEPENING THE FORM

Collection of E. L. McLeod

side of this part of the subject is so well explained by Holmes,* that it is here necessary only to make plain the technical elements and processes involved in ornamentation.

As on Pueblo pottery, so on basketry, some patterns are merely likenesses of things, and that is all. A step in advance of this is the portraiture of some particular and sacred natural feature, mountain, body of water, trait, etc. Pictography is one grade higher, and, beginning with attempts at figuring animals and plants entire, runs the whole gamut of transformation, ending with conventional metonymies, synecdoches, and geometric patterns of the classic type.

Form and Structure

Form in basketry is decided at the outset, not by the desire to create something artistic, but to produce a useful receptacle. There is scarcely a basket so rude, however, that a sense of symmetry and other artistic qualities did not enter into its composition, both as to its general outline and the management of its details. These varied forms are decided in reality by:

(*a*) Function, which is discussed in the chapter on uses, from the purely industrial point of view.

(*b*) Materials, shown in the chapter on manufacture as to their variety and quality, but here considered as suggesting and restricting form.

(*c*) Imitation of natural objects and of forms of utensils in other materials.

(*d*) Physiological limitations. Both in the making of the basket and in using it the Indian woman had ever in view the convenience of her own body. The curves of the basket itself, the length and the width, the proportion of all its parts, as well as convenience of holding, transporting, and utilising, all had reference to the woman's physical frame.

(*e*) Esthetic purpose. The desire to produce something beautiful in itself without any regard to other motives.

* Sixth Annual Report of the Bureau of Ethnology, Washington, 1889, pp. 189–252.

If there be any beauty in work belonging to the first step, it is purely *adventitious;* the weaver did not effect it purposely. In the next higher grade there are no separate elements of beauty, but the utilitarian features are dominated by taste purposely. A third class of esthetic forms, one step higher, enhances the beauty of the basket, but does not diminish its serviceability. It seems a pity to waste so much prolonged work and lovely design and colour on a mere berry-picking basket or a pot for cooking with hot stones, but who will say nay? Finally, usefulness is ignored or sacrificed to pure estheticism. (See Plates 11, 23, 45, 70, and 71.)

When the very lowly and practical functions of a great deal of this ware are considered, one has a striking example of the way in which the sense of beauty may coexist with forlorn poverty and surroundings, as may also be seen by comparing the most skilful basketmaker with her workshop. This thought must not be carried too far, however, in understanding the culture status of the woman, since all artists are busy practically with uncleanly materials and do not wear their best attire in the studio. On the same practical side, also, the love of beauty for its own sake may not be the entire motive in the artist's mind; her natural ambition and pride of achievement in technical skill, and perhaps envy, have much to do with preëminent success—quite as much with her as with artists at the other end of civilisation. The same discrimination is made by art critics in the highest walks of culture. The singer or musician who renders a technically difficult piece may be stimulated quite as much by pride of performance as by the overpowering influence of esthetic feeling. It is difficult to sound the depths of the Indian woman's motives, but in the matter of shape, as will be seen, her masterpieces are fine models of symmetry and grace. Quite every plate in this work will illustrate in some way or another what will be said respecting the ornamentation of Indian basketry in the six geographic areas. In each one of the phases under

Plate 41. See page 139

BOTTLE-NECK COILED BASKETS, KERN COUNTY, CALIFORNIA,
SHOWING POTTERY MOTIVES

Collection of E. L. McLeod

which shape as a decorative element is studied there will be found a response in the different parts of the hemisphere.

The study of form and structure in the ornamentation of basketry will be now considered under the heads named: First, the shape of the basket as a whole; second, the minute structural elements out of which all designs on basketry are formed; and third, the designs on the surface of the basket and their combination into symbols or composite ornamentations. (See Plate 37.)

SHAPES OF BASKETS AS A WHOLE

The shapes of basketry have relation to the forms of solid geometry. The cube, the cone, the cylinder, the sphere, are the bases of all simple and complicated varieties. In softer material basketry approaches matting. The products are then flat or pliable, although the process of manufacture is the same. Among the eastern tribes of the United States the Algonkin and Iroquois baskets are all cylindrical or rectangular in outline. The same is true of the tribes in the southern United States, although the greater flexibility of the reed cane invites the basket-weaver to a wider diversity. In the Interior Basin and everywhere else the wild flax and other fibrous plants abounded, the sack, rectangular in outline, prevailed, but in the western portions of Canada east of the Rocky Mountains the prevalence of birch bark occasioned a variety of solid forms. The Indians of the Interior Basin also employ the cylinder largely. The same is true of the Eskimo, of Alaska, while the Aleutian Islanders, especially in the outer islands, having the flexible wild grass to work with, return to the form of the bag or satchel. The cylinder and the rectangle prevail among the Haida and Tlinkit, while the soft wallet, rectangular in outline, was more common farther south. The Salish and other tribes of Indians, of Columbia and Washington, diversified in their tribal and linguistic elements, produced many forms of baskets. Those in touch with the

Hudson's Bay Company were very quick to imitate the shapes of packages used by them. In this region, also, since the boiling with hot stones was a prevalent method of cooking, the basket-pot, somewhat cylindrical in motive yet more in the form of a truncated cone, was seen in every house. What is said about the diversity of form among the Salish tribes is true all along the Pacific coast of the United States. Here also are to be found conical baskets in great abundance, since the people were partly vegetarians or diggers. The carrying-basket is a prominent feature in collections from this area. From these simple geometric forms were developed dishes, jars, bottles, packing-cases, and so on, in unlimited numbers, combining the cylinder, the cone, and the rectangle. In many of these the jar-shaped necks of pottery are imitated, in which the elements of the sphere and the spheroid are used.

In giving to basketry the forms just indicated the Indian woman has always in mind the elements of the beautiful as well as of the useful. It is considered a reproach to violate the rules of bilateral symmetry or proportion in form. A superficial view of a large collection of baskets from any portion of America would strike the most careless observer as the fruits of thoughtful and painstaking labour on esthetic lines. These forms are often said to be mere imitations of something the savage woman has seen in Nature or in other arts. Imitation is indeed one of the elements in this problem, but it is an entire misconception of the underlying plan to suppose that the skilful weaver is a slave to natural patterns. Indeed, it might also be averred that she is less subservient to such things than are artisans of much higher grade. On entering the workshops of civilisation one sees the walls loaded with designs and models after which to work, but rarely would the observer see an Indian woman looking to any other source than her own imagination for the model of her basket; strictly speaking, she never makes two alike. A close observation of the weaver at her work demonstrates the fact that the eye,

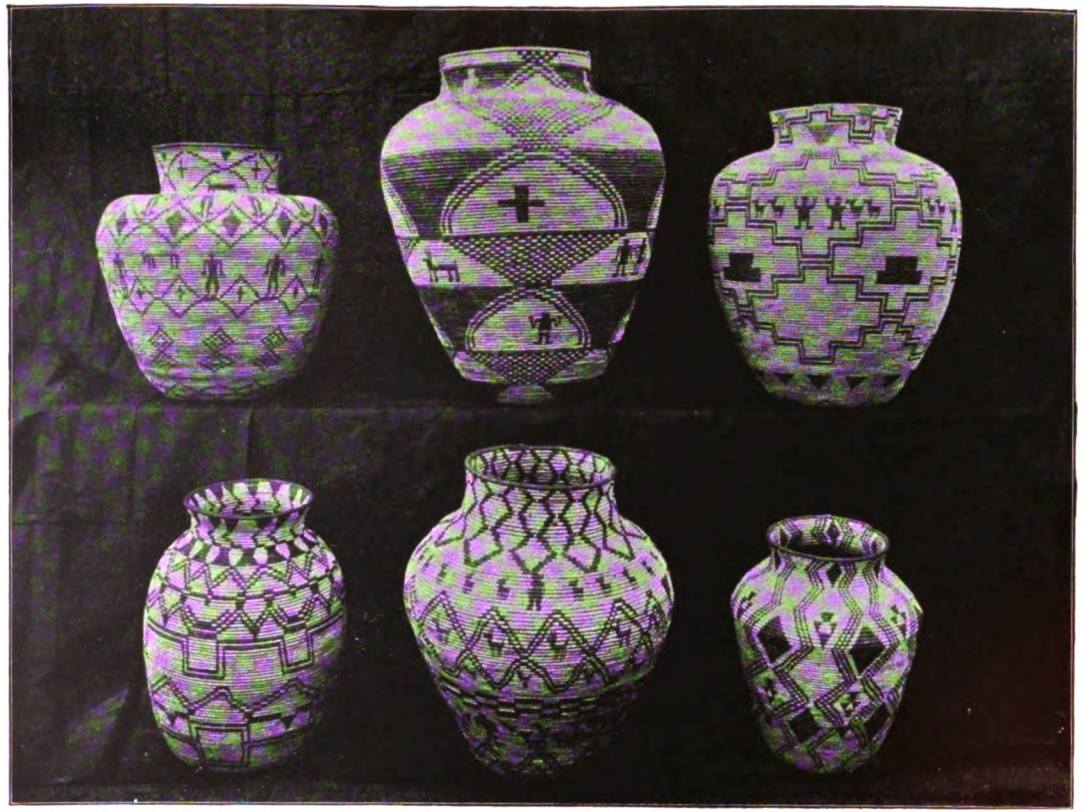


Plate 42. See page 139 OLLAS, OR LARGE WATER JARS, OF THE APACHE, ARIZONA, WITH MIXED DESIGNS

Collection of J. W. Benham

the hand, the curves of the body, the angles of the lower limbs, all contribute their share to giving beautiful forms to basketry. The following illustrations will show the gradations of general outline through which basketry passes, the maker keeping always in mind the sense of pleasure to be awakened or gratified.

They are as follows: *a*, flat forms; *b*, dish forms; *c*, bowl forms; *d*, jar forms; and *e*, miscellaneous forms.

(*a*) The simplest of these is the flat tray, mat, wallet, sail, gambling-plaque, and more. They assume endless varieties of outline, and through the stimulus of trade all sorts of shapes result, table-mats of standard patterns in Sitka and Vancouver Island, rectangular wallets in Washington, Idaho, and Montana, but especially the gambling-plaques of California.

Plate 38 shows two flat plaques of this form, the upper one from the Tule River country, Tulare County, California, the lower one from Madera County, both in the collection of E. L. McLeod, of Bakersfield, California. The coiling, if well done, would produce the circular outline. The Indian woman who constructed the plaque made the stitches under the spell of this art motive. A number of additional examples of artistic forms in flat basketry will be found in Plates 6 and 61.*

(*b*) Use coöperates with beauty in deepening the basket into a shallow plate as among the Hopi (Moki) for the sacred meal in their prayer ceremonials, but more attractive still are the so-called Navaho ceremonial baskets. (See Plate 39.) These beautiful objects have attracted much attention also through their association with Navaho ceremonies. They are called ghost drums, wedding baskets, and various other names, all associated with the Navaho religion. The dish-baskets shown in the plate are in the collection of Fred Harvey. The same form exists along the Pacific States wherever meal or other vegetal diet is eaten. They are the common dish in

* W. H. Holmes, Report of the United States National Museum, 1900, Plate XLI.

which the mush is served throughout the acorn-bearing parts of California. It is an excellent example of adaptation to use, consistent at the same time with correct esthetic expression. Doing her best in producing the proper form, the basketmaker was not hampered by the fear of lessening utility. Figures of similar shapes will be seen in Plates 93 and 216.

(*c*) Deepening the plate gives the bowl an unlimited number of forms and emancipates the basketmaker. All through the southwestern United States the olla is the prevailing form. It is a segment cut from a sphere, marvellous in symmetry when the production of a master hand. Departing from this simple outline, varieties are produced by flattening the bottom and straightening the body until the truncated cone and regular cylinder are reached. The quality of the material used may have a little to do with the general outline, but it is charming to see how easily the savage woman overcomes the obstinacy of Nature and persuades reluctant wood to do the work of grass and soft fibers. Cylindrical forms are in favour with the Aleuts, with the Haidas of Queen Charlotte Islands, with the Tlinkits of southeastern Alaska, and some tribes in Washington and Oregon. In the eastern parts of Canada and the United States cylindrical forms are mixed with rectangular. The baskets shown in Plate 40 are in the collection of E. L. McLeod, of Bakersfield, California. These are all from Kern County, and include hats as well as domestic forms. It will be noticed that some of the examples have straight conical bodies and others are curved outward, but none are incurved. As models for modern basketry these shapes can not be improved upon, since they are grounded in the structure of the human body itself. Reference will be again made to the baskets in this plate when the elementary forms are studied that go to make up the designs. The photograph does but half justice to the basketry from this region, which adds to the beauty of outline and variety of design the charms of tints and colours in varied materials.

(*d*) Baskets with constricted borders go by the general name of bottlenecks. If a motif be sought outside the desire of the Indian artist to have it thus, there is a style of old Pueblo pottery at hand which stands preëminent in the southwestern United States.* After the body of the vessel or basket is built up to the required height the work is drawn into the form of a jar or bottle. Attention has already been called to the fact that no pottery existed formerly on the west coast of North America. The few exceptions to this rule only intensify this absence. The place of pottery is taken by basketry, even for cooking. There is no limit to the pine trees yielding gum which will render basketry water-tight. The bottle-shaped basket soon appears and is installed as Aquarius of the Utes, the Apache, and other tribes, and also as a seed vessel. No sooner was its office fixed than it began to dress up in artistic form, and the inimitable bottleneck of the Panamint and other tribes in the Inyo-Kern and Tulare area appeared. The Apaches are having the last word at this point in the adoption of correct esthetic forms purely European. Plate 41 shows a group of Kern County bottlenecks in the collection of E. L. McLeod. Plate 42 illustrates a number of Apache ollas in the collection of J. W. Benham, of New York City.

That these pretty jar-shapes have little significance so far as tribes are concerned is shown by the fact that they occur all the way from Point Barrow in Alaska to southern California.

(*e*) This class includes all odd forms whatever. They are frequently made in imitation of objects that struck the Indian woman's fancy. The very best examples of this are the imbricated baskets of the Fraser-Columbia drainage. A good collection of them tells the whole story accurately, starting from the conical forms, with foundation of splints and bottoms in shape of a watch-spring to be found on the Klikitat and the Thomp-

* J. W. Fewkes, Seventeenth Annual Report of the Bureau of Ethnology, 1898, Plates 130, 131, 143.

son River and ending below and above the Fraser mouth with flat and uniform foundation and straight lines in the bottom, the last shapes in the series being nothing more than imitations of Hudson Bay Company's packages, trunks, cradles, and so on. These bizarre shapes are not confined to the mere imitation of white men's devices. The demands of ceremony and religion required special forms of basketry (see Plates 43, 157–172).

Finally, ornamentation in the form of the basket as a whole has kept pace with the multiplication of uses. The first contact of the Indians with the whites created new desires in their minds. Furthermore, it was not long before they discovered their best interests to lie in the direction of service to their conquerors. The supply of new wants and responses to the demands just mentioned would necessarily break in upon the ancient régime. Not at first, however, did the new object respond to the best workmanship. Plate 44 represents a part of the outfit of a Tlinkit Indian in the service of the Russians. Among his other accoutrements there must be a receptacle for ammunition. This must conform to those already in use. The result is the three forms shown in the plate. First, a small jar-shaped holder with a basketry cap-like cover; second, a bullet-holder, in which the one basket fits exactly over another; third, a combination in which the cover is attached to the basket by means of a running-string. All of these forms are shown in the plate. While drawing attention to these designs it will be well to examine their characteristics. The cover of No. 2 is plain twined weaving of the old-fashioned sort. The attractiveness of the work is in its regularity, both of vertical lines and horizontal weaving. The under portion of this double basket is covered over with false embroidery designs. No. 1 is an evident departure from ancient shapes, and the surface is covered with poor work in embroidery. No. 3 is more worthy of scrutiny. On the outer basket, or cover, plain weaving and embroidery alternate in single lines and

Plate 43. See page 140

VARIED FORMS OF IMBRICATED BASKETS, TO SUIT THE FUNCTION,
BRITISH COLUMBIA AND WASHINGTON

Collection of E. L. McLeod

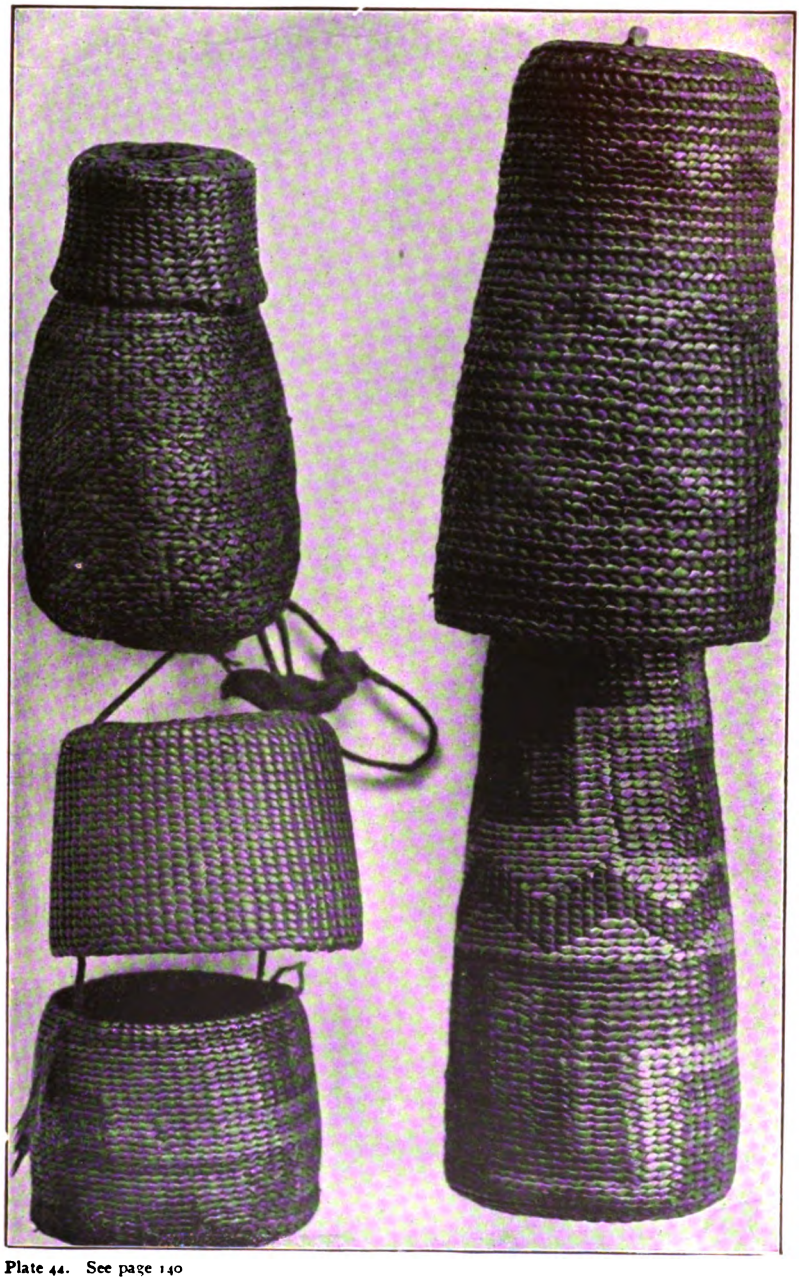


Plate 44. See page 140

TWINED WORK WITH FALSE EMBROIDERY, COPYING EUROPEAN DESIGNS, TLINKIT INDIANS, ALASKA

Collection of L. H. Brittin

narrow bands. The lower or inside basket has its surface enveloped in embroidered weaving of excellent character, and is wrought in three colours. The specimen is in the collection of L. H. Brittin, of Edgewater, New Jersey.

Mosaic Elements in Decoration

The composition of the basket—its molecular elements, so to speak—is guided largely by the materials. In cross-section they are in their coarsest forms round, then half-round, resulting from splitting whole stems. The finer sorts arise from further subdivision of stems, being roundish on the outside and flat within; or flat on both surfaces, as in the Canadian ash splints and the flat foundations of Fraser River baskets; or ribbon-like, as in basketry made of palm leaves; or thread-like, as in the coiled basketry of the Pomo, sewed with split sedge root as fine as packthread. These various kinds and grades of materials in their tractability are dependent on climate, latitude, and phytogeography in the first place, and finally upon the maker's grade of culture, on the form and function she had in mind, as well as on the higher forms of fine art, social rivalry, and mythology (see Plate 45).

In ultimate structure, basketry is free-hand mosaic or, in finest materials, like pen-drawings or beadwork, the surface being composed of any number of small parts—technically decussations, stitches, or meshes, practically separate from one another so far as the effect on the eye is concerned. These mosaic parts are with some materials quite flat on the outer surface, as in the best matting and bags, while in others they stand out on account of the coarseness and rigidity of the wood. The object of mosaic ordinarily is to produce a flat surface for pavements or floors. The term "mosaic," here used as a simile, applies to such as is seen in mural decoration, where projections and depressions are wrought into artistic designs. In much basketry the separation of the stitches and exposure of a warp beneath having another colour have precisely the

same effect. In many examples the stems and roots are thoroughly soaked and rendered plastic and then pressed home, the parts being forced together, in which case the little elements become spindle-formed or hexagonal. Mosaic effects in basketry may be—(*a*) Tessellate, as in checker or twilled weaving; (*b*) concentric, as in wicker and twined weaving; and (*c*) radiate in all coiled weaving. These must be kept in mind.

Unity in variety, the underlying principle of all esthetic composition, finds its first step illustrated in the making up of a basket. The perfection of an Indian basket in its artistic technic is monotony, or monotechny, if such a word existed. In looking at a clumsy bit of work done by a child, or a beginner, one is aware of painstaking effort to make all the checks or stitches alike, ending in failure. In the most elegant pieces the victory is won, unity is achieved. With her mouth for a vise and for other purposes, with a flint knife and educated fingers, the patient and skilful artist formerly brought all her filaments to uniform thickness. At present, scissors, awls, knives, and gauges (all of metal) aid her immensely in her task. The eyes and hands coöperating, in some instances through a hundred thousand efforts, produce elements of astonishing uniformity. This unity is of a very high order; for in many examples, coupled with a monotony of elements absolutely under control of the artist, there is at the same time a charming variation in width and length of parts in harmony with, and made necessary by, the widening and narrowing of the basket. This unity in a myriad of details is the more noteworthy in a basketmaker's art, in common with that of all other textile workers, because the individual elements are not lost or destroyed in the operations. The exceptions to this are rare, as in a few California specimens, where the coiled sewing is entirely obscured by overlaying of feathers. Usually the perfection of the stitch is the aim of the worker.

Plate 46 is a rare coiled basket made by a Washoe woman named Datsolalee. It is in the collection of A. Cohn, Carson

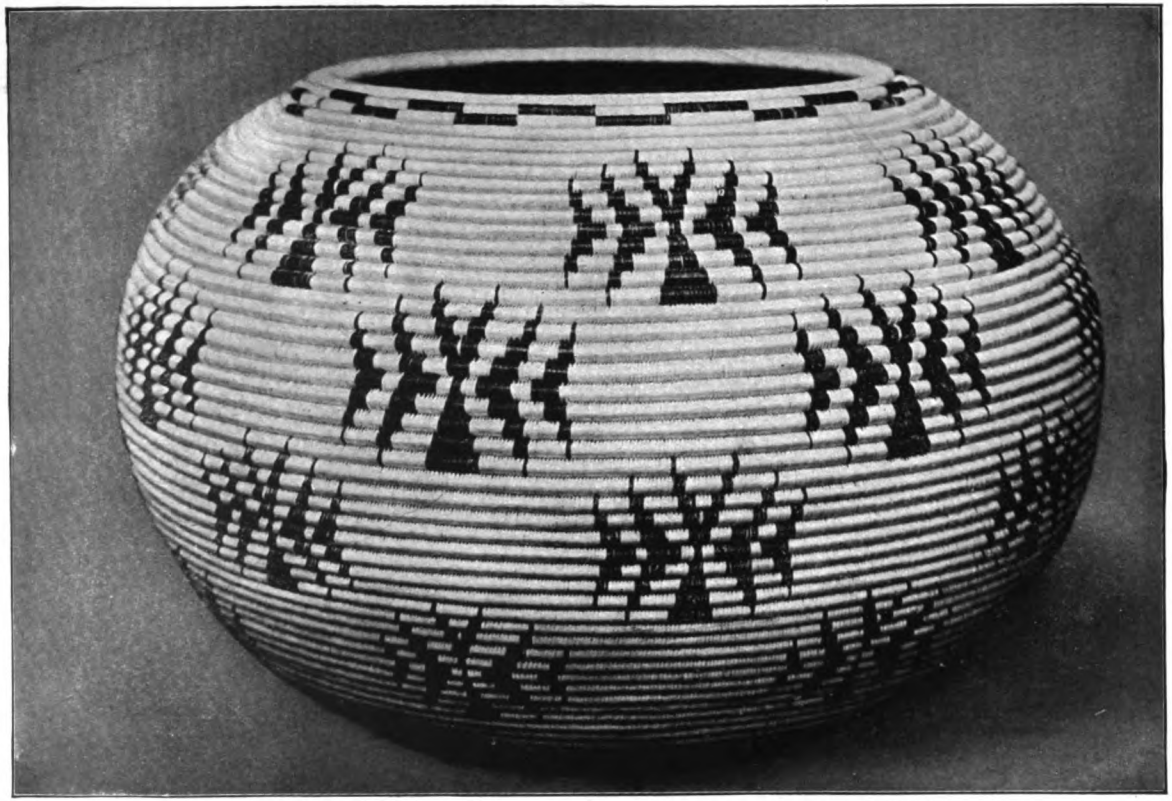


Plate 46. See page 142 FINE COILED BASKET OF THE WASHOES, NEVADA. DESIGNS OF BIRDS MIGRATING

Collection of A. Cohn

City, Nevada. The piece measures 8½ inches high, is 12 inches wide, and 6 inches wide at the opening. The stitches number more than fifty thousand, being thirty to the inch. The body colour is a rich light gold, and the figures are in red and black. It weighs 16 ounces, and is valued at many hundreds of dollars. The figures on the basket represent birds migrating or flying away, the motto being, "When the birds leave their nests and fly away, we shall move." The shape of this piece and the quality of the sentiment in the markings are excelled only by the inimitable quality of the work on the surface. It is difficult to conceive of a more perfectly uniform piece of handiwork than this.

In pottery all vestiges of coiling and moulds are commonly obliterated. In a very few examples of ancient ware there seems to have been an aim to perfect the coiling and render its detail monotonous and artistic, but in the many thousands of other examples the potter has erased the marks of the fingers, the paddle, and the mould. On the other hand, the whole development of the art of basketry has been an effort to perfect the individual stitch, or mesh, or check, if necessary to make any number of thousands of them exactly alike over the entire surface of a large receptacle, or to study the greatest possible number of variations that may be given in form to these primary elements consistent with the unity of the whole effect. The Eskimo near the mouth of the Yukon must have only lately acquired the art of basket-making. With coarse hay for the foundation and sinew for thread, they produce the clumsiest excuses for basketry, ugly in form, slovenly in stitching, and utterly devoid of designs on the surface, while the Aleuts, close by, have unique elementary forms and work with surprising uniformity. With the monotony of the mosaic elements in any basket, one must not fall into the error of thinking that there is not the greatest variety of fundamental shapes in the things to be monotonised. They vary in outline and relief in position with reference to the horizon—

that is, the rim of the basket, in relative proportion of the whole and its parts.

In checkerwork, the basketry tiles, one might call them, keeping in mind the use of the word mosaic, are squares or rectangles in close or open work. The mosaic of checkerwork pleases by its uniformity, and yet many baskets made by hand with tools not over refined have in them enough of variety to relieve them from the dull monotony in machine products. Flexibility in materials, as between hard-wood splints and those of cedar bark and palm leaf, offers all the chance the weaver needs to play tricks in reliefs. The eye is never

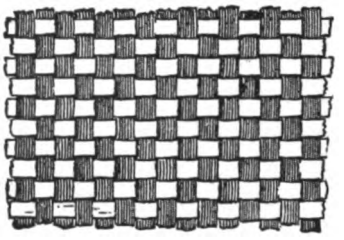


FIG. 92.
CHECKER ORNAMENT IN TWO COLOURS.
After W. H. Holmes.

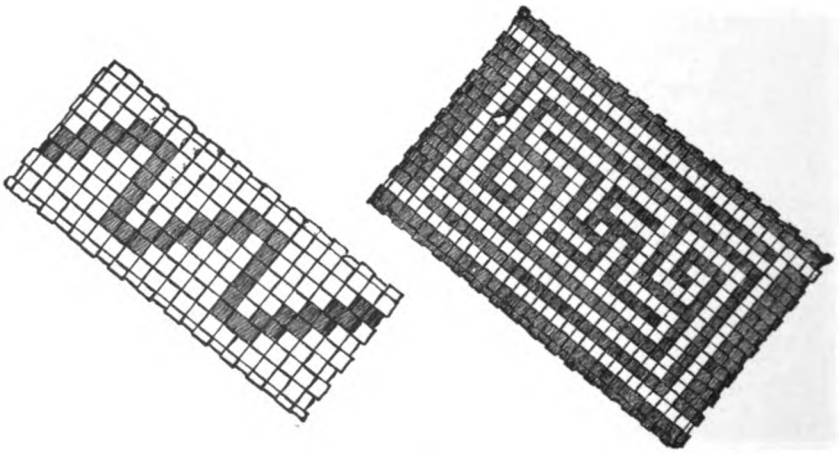


FIG. 93.
AMAZONIAN BASKET DECORATIONS IN CHECKER.
After F. H. Cushing.

wearied in rambling up and down among these crooked paths. There is possibility of variety even in checkerwork, through changing the width of warp and weft elements.

Oblong rectangles there mingle with tiny or larger squares in tessellated surfaces (see Plate 14 and figs. 96 and 97).

What is here said concerning the esthetic effects produced in the plainest kind of checkerwork by simple alternation of the colours is illustrated by fig. 92, after Holmes in the Sixth Annual Report of the Bureau of Ethnology, already quoted.

Fig. 93, from a drawing after Frank H. Cushing, is a more interesting illustration from the Amazon region. The surface of the basket is mosaic in two colours, made up of little square blocks, and by their alternation not only sloping and vertical patterns are produced, but the most intricate labyrinth of fret-work. There is no limit to the possibilities any more than there is to the Italian workman making a tessellated pavement with marble blocks in white and black.

As soon as the weaver steps outside of her monotonous checkerwork into the province of wicker, or especially twilled weaving, the possibilities of ornamentation are infinitely multiplied. In plain weave, wicker elements are sigmoid or spindle-shaped; on twilled weaving, they are oblong rectangles. Passing into the most intricate damask effects in modern linen weaving, in which materials of one colour only have to be used, it will be seen how greatly varied this sort of ornamentation may be made. The elements of wickerwork mosaic are horizontal, but twilled weaving in single elements may be both vertical and horizontal in the same piece. The three accompanying figures are from Holmes, and show better than words the possibilities of the little squares and rectangles for decoration. In fig. 94, in two colours, the white work is under two and over one; the

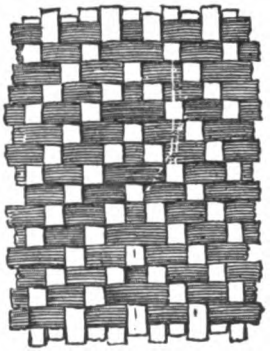


FIG. 94.
TWILLED WORK IN TWO COLOURS.
After W. H. Holmes.

weft over one, two, or three and under one; the result being a series of sloping designs of great beauty. Fig. 95 in precisely the same materials shows how, by varying the count, the pattern is changed. Fig. 96 is interesting because it exhibits a widespread type of mat-weaving farthest away from loom work. The woman begins at the corner to weave. All the little blocks are rectangles; all stop at the same angle, and the result is a perfect Greek fret in two colours (see Plate 47).

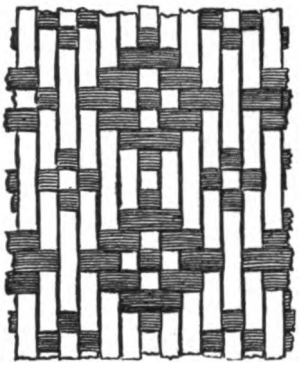


FIG. 95.
DIAPER TWILLED WORK IN TWO COLOURS.
After W. H. Holmes.

In twined weaving the effect of the single rows is funicular one way and corrugated the other. If the reader will notice any number of twined baskets in plain twined weave, it will at once become apparent that it has

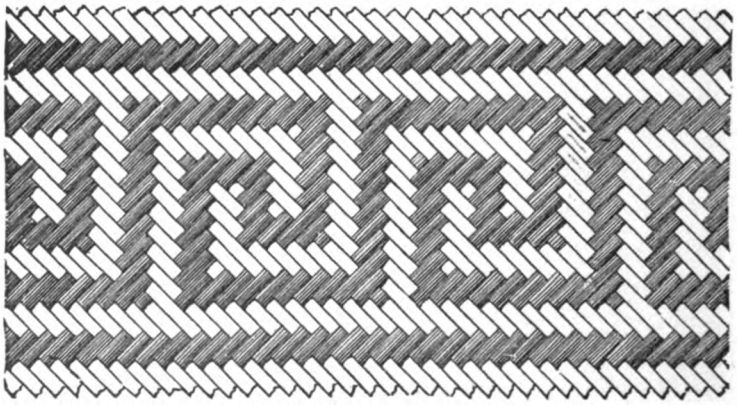


FIG. 96.
DIAGONAL TWILLED ORNAMENT.
British Guiana.
After W. H. Holmes.

its limitations. The Pomo make only bands in it to represent the skin of a snake or some such motive. The Haida and

Plate 49. See page 152

THE FINEST OLD COILED SANTA BARBARA MISSION BASKET
JARS WITH COVERS

Collection of the Misses Eaton

Tlinkit vary the ribbed effect with decorative overlaying or three-strand weft. With the diagonal twined work the case is entirely different. The boldest of spiral designs covering an immense surface are wrought in weaving in twilled fashion. Nothing can excel the Pomo, Pit River, and other northern California carrying-baskets in attractiveness of decoration. In openwork twining, where the warp has a chance to show its versatility, as in mound-builders' ware, but especially in Aleutian wallets, the pleasing effects in a single colour are without end. For examples of the great variety in twined work decoration see Plates 19, 21, and 48.

Plate 48, illustrating twined decoration in its elements, is a representation of food-bowls of the Klamath Indians of southern Oregon. These old specimens were among the first received at the United States National Museum, and were collected by George Gibbs, Cat. No. 7,568, U.S.N.M. The resources of ornamentation used by the Klamath Indians are fine stems and rods for the fiber, different colours in the wood, and superadded elements for decoration. Much of their work is done in soft material, and in the type of overlaying used by them the ends are fastened off carelessly on the inside of the structure so as to give a rough appearance.

Further illustrations of Klamath ornamentation, as well as that of their kindred, the Modocs, will be found in Plates 167, 174.

One of the prettiest and boldest attempts at securing effects in twined weave in the United States National Museum is from the vast cemetery of Ancon in Peru. The illustration (fig. 97) shows the decorative belt on a small work-basket made from rushes. One might be deceived into thinking that the motive came from the Yokut Indians of California (figs. 98 and 99), but a glance at the texture reveals a different method of achieving the same result. The warp is double, consisting of two straws side by side as in the Aleut wallets. At the bottom are three rows of plain twined weaving, each twist inclosing two

warps. Follow these pairs up to the top of the basket, and note that the two rows of twined weaving—one dark, the other light—also inclose pairs, but not the same pairs, between the single twinings. Here seven human figures are woven in black on a brown ground. The pairs are holding in their hands between them a rhomboid object, reminding one of an Iroquois wampum belt in which two warriors are shown as bearing the sacred pipe. The weaving on this space is twilled mixed with twined, the latter being subservient to the former. The warp elements no longer are worked in pairs, but singly. The

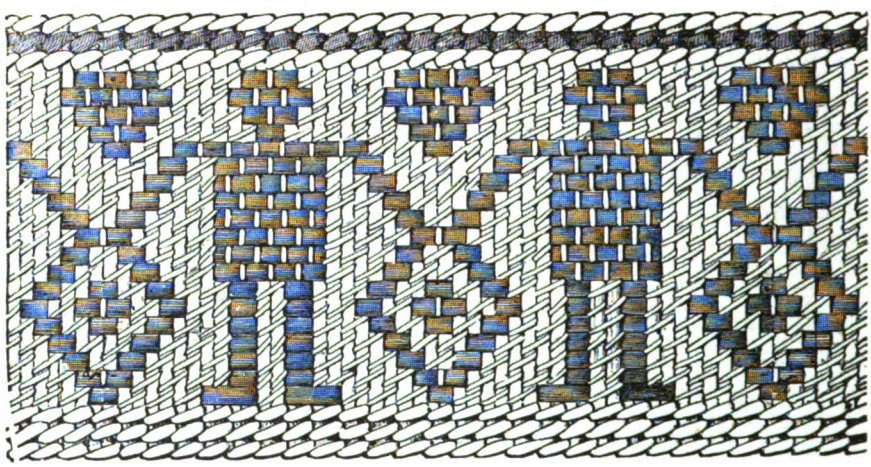


FIG. 97
HUMAN FIGURES IN TWINED WEAVING.
Ancient Peru.
After W. H. Holmes.

twined weaving on them is twilled on the brown body surface and vertical across the black rectangles, making the double warp conform to the twined weaving below everywhere save on the feet. All this is finger work, and deserves a prize for its maker both for the plan and the size of the molecules.

Coiled basketry, on the contrary, is made up of radial elements only, which are the stitches, some being long and thin, others short and wide. The esthetic effects depend on the

quality of the material. The very coarsest ware of the Utes and the Klondike nations has little beauty of texture, while that of the Alaskan Tinné or the California Washoe, Panamint, or Pomo is faultless. In finer coiled work, when the stitches barely interlock, they appear to stand one over another from

FIG. 98.
DESIGN ON COILED BOWL.
Tulare Indians.
Cat. No. 19,691, U.S.N.M. Collected by Stephen Powers.

row to row; but when the stitches pass underneath one of the rods at least of the foundation below, there is an alternation of stitches with open spaces on the surface resembling twilled weaving, each one being wedged between two, over and under. It is impossible to trace any ornamentation in coiled work among the eastern Indians of North America, through lack of

material. The Arctic Alaskan coiled basketry also is lacking in colour features. It is not until the Salish tribes of British Columbia are reached that attempts are made to produce beautiful effects in the primitive coiled elements of ornamentation. The resources of the artist are fourfold.

(1) Her regular stitches are in tough root splints coiled in such manner that the smooth outer surface of the last year's

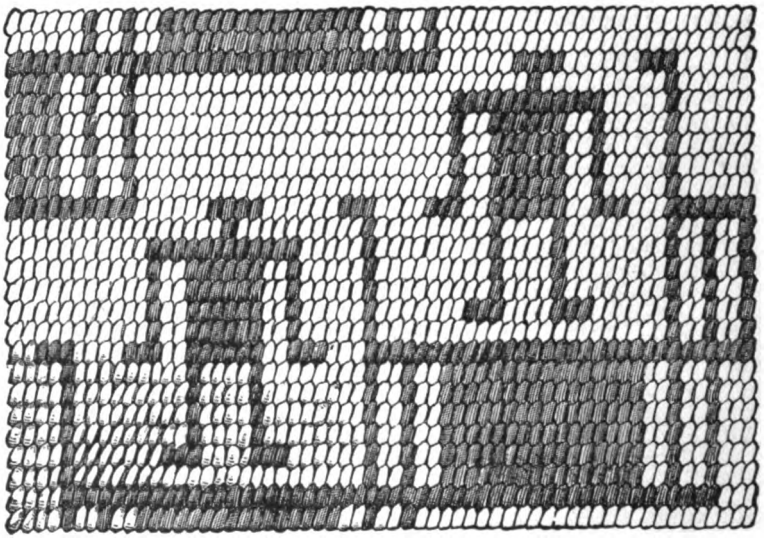


FIG. 99.
DETAIL OF FIG. 98.
After W. H. Holmes.

growth is exposed to view. Seldom will the rough inner splints which constitute the foundation come into sight through or between the stitches. Indeed, there is a type of weaving in this area in which smooth, thin strips of wood are laid together in pairs so that when the warp is exposed it is the bright outer surface that is seen. The Salish woman is not backward in making most of her opportunities with the dull brown colour of the cedar in that she has learned to practice uniformity in the stitches themselves.

(2) Mention has already been made of splitting stitches in

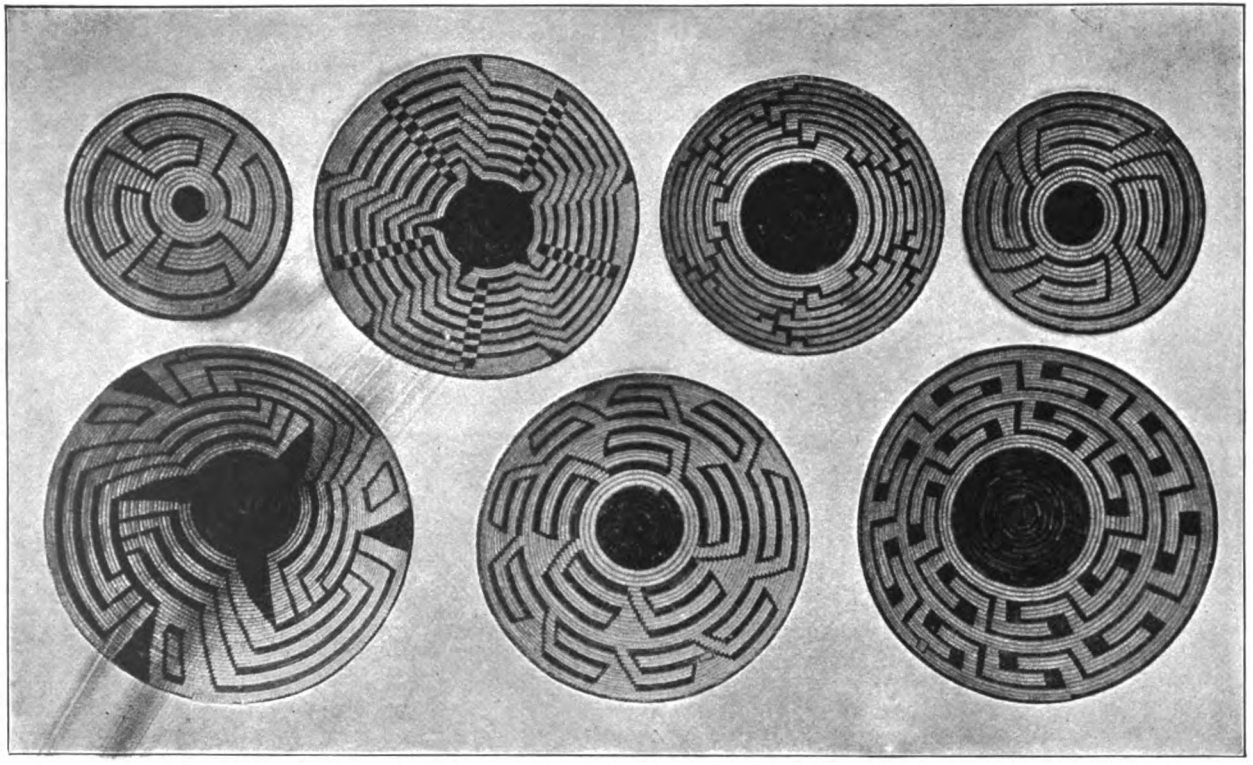


Plate 50. See page 155

COILED BASKET BOWLS OF THE PIMAS, ARIZONA, SHOWING THE CAPABILITIES OF WANDERING LINES

Collection of F. M. Covert

the sewing of these savage women. It is done in such a careful manner that it becomes an element of beauty, otherwise it would become a contribution to ugliness. Examples of this work will be seen in Plate 24.

(3) Another resource of ornamentation in the elementary American work of coiled basketry has been well used by the Salish Indians—that is the so-called beading, which consists in running a strip of bright grass in and out among the coiled stitches at regular intervals. Many examples of brown cedar sewing with bright golden-coloured straws for the beading are in the United States National Museum. This arrests the radial effect of the coil stitches and substitutes the concentric or parallel motif.

(4) The last elementary resource referred to among the Salish tribe is imbrication, which will be more minutely described in the section devoted to colour in ornamentation. The sewing on such specimens is entirely obliterated and the surface reconstructed in yellow, red, brown, and wood colour, the effect being tessellate mosaic.

Among the California tribes, these coiled elements, being much smaller in size than those in the baskets of the Salish tribes, afforded opportunity for different artistic effects. An inspection of the work done by Pomo, Maidu, and other tribes of northern California shown in many plates and figures will prove this.

Fig. 98 is from the surface of a beautiful coiled basket of the Tulare Indians, Tulare County, California. It gives an opportunity of studying the elementary stitches on the best of coiled work. These Indians have at their command four colours, that of the root or wood with which the body of the basket is sewed; black filaments taken from the root of a peculiar sedge; where the redbud or cercis is available, the outer bark is a rich brown and the inner side quite white; in addition, there is a bright reddish root, *Yucca arborescens*.

The stitches are, of course, hexagonal in form, but the press-

ing of the wood together gives them quite an oval outline, and they naturally, in the course of sewing, incline toward the right. With these colours and oval elements, to which the artist is bound to restrict herself, the attempt is here made to produce a step-formed cycloid. In the spaces between each two designs is the figure of a man. It is interesting to note how, under such narrow restrictions, so good effects can be produced.

In southern California, among the Tulare and other neighbouring tribes, as well as among the Apache and Navaho, most pretentious figures are attempted in coiled elements. Fig. 99, after Holmes in the Sixth Annual Report of the Bureau of Ethnology (fig. 339), furnishes a good example of what is here mentioned, but the furthest departure from old-fashioned types is exhibited in the work of the Apaches, who attempt all sorts of animal forms in coiled work, and the Pima tribes, who lose themselves in labyrinths and frets.

The basket from which this elementary rectangle is taken will be found illustrated on Plate 30 in Report of the United States National Museum for 1884.*

Plate 49 shows two covered jars in exquisite coiled work, brought from Santa Barbara, California, by William Alden Gale, of Boston, between 1810 and 1835, and owned by the Misses Eaton. The upper basket is 11 inches high and 5 inches wide; the lower, 15½ inches wide and 10 inches high. They are introduced here for the purpose of calling attention to their combination of esthetic qualities. One does not know which to admire most, their forms, the fineness of the stitches, the simple but effective designs, or the charming effect of colour both in the patterns and in the mosaic work. Covers on baskets from this area are rare and may not be ancient. It is just suggested that their motif came from the old preserve jars common in ships' outfits a hundred years ago.

* See also Stephen Powers in Contributions to North American Ethnology, III, 1877, p. 256.

In fig. 100 the ornamentation has all the features of lace-work; indeed, it might be called the beginning of lace. The detailed drawing above the figure shows, however, that the example is simply a piece of coiled basketry from which the foundation rows have been carefully withdrawn and only the sewing remains. In the long stitches between, the thread has been simply wrapped twice around the standing part instead of once.. It is within the weaver's power to make this change at any moment from single wrap to double wrap, the result being a figured surface, as in the lower drawing. This sort of ornamentation has rare existence north of the present boundaries of Mexico, but may be found all through tropical America. The example here shown was procured from the Pima Indians of the Piman family in Arizona and Mexico, but beautiful examples were collected by W J McGee among the Papagos, their kindred.

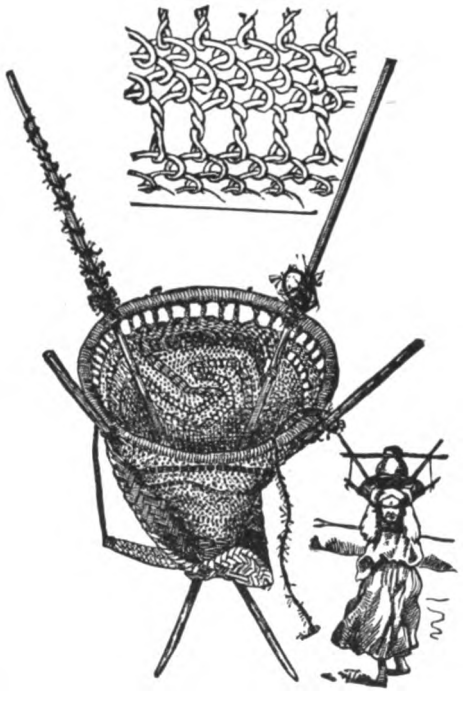


FIG. 100.
PIMA CARRYING-FRAME.
Southern Arizona.
Cat. No. 76,033. Collected by Edward Palmer.

DESIGNS IN DECORATIONS

The fundamental checks, decussations, stitches, and meshes of which the mosaic of basketry is made up are used, associated

or not with colour, in forming designs or patterns on the surface. Compare the severely plain Haida cylinder wallet with the exquisitely decorated hat from the same tribe. Both are in the colour of the spruceroot, but the latter resembles fine lacework on account of the delicate pattern covering its surface. All Indian tribes know how to give variety to unity by simply making up various technical compositions that add no new processes. These compositions are aggregations of simple forms which are the alphabet of the Indian woman's most intricate patterns. It matters not how complicated the whole design may be, it is composed of the following simple parts:

(*a*) *Lines in ornaments.*
(*b*) *Squares or rectangles.*
(*c*) *Rhomboidal figures.*
(*d*) *Triangles.*
(*e*) *Polygonal elements.*
(*f*) *Complex patterns.*

It may be well to devote a little more space to the consideration of these. Many seemingly incomprehensible patterns become clear when resolved. At the same time, the secret of their pleasure-giving quality is revealed. Just as a subtle pleasure creeps into the mind in scrutinising the uniform stitches on the surface of the Washoe basket (Plate 46), so, in a higher sense, the orderly recurring of the same geometric shape over and over in an intricate design adds to the enjoyment of the whole. These elements are not exact, however, being hand-made and bounded by lines produced by the curved forms in most basketry. The artistic effect is thus heightened.

(*a*) *Lines in ornament.*—It may not have occurred to the reader to observe how scrupulous almost every Indian basket-maker is to relieve the monotony of her work by a simple line of some other kind of weaving. It would be safe to say that no basket is without them. In the entire Hudson collection in the National Museum there is not a twined basket whose texture is not improved in more than one place by a line in a differ-

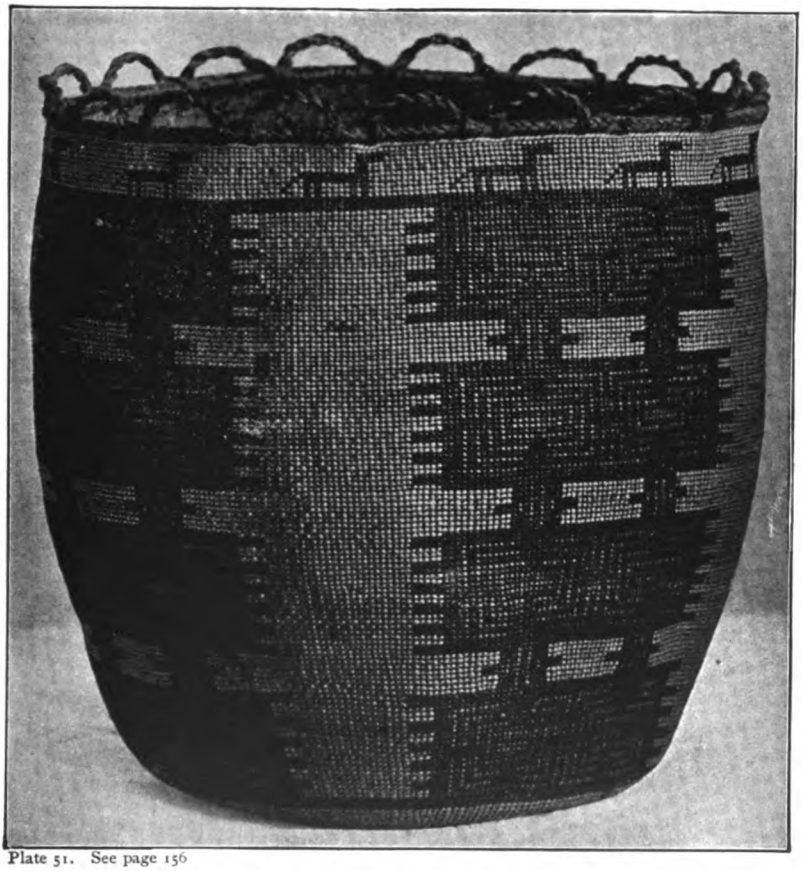


Plate 51. See page 156

SKOKOMISH TWINED WALLET WITH OVERLAYING, WASHINGTON, SHOWING CLEVER USE OF RECTANGLES ONLY

Fred Harvey Collection

ent style of technic. These lines may run in almost any direction, and, as in the Haida hat, be worked into geometric figures.

Plate 50 is a collection of Pima basket-bowls from southern Arizona, belonging to F. M. Covert, of New York City. It shows how many different effects are produced in the same tribe by the mere administration of lines wandering about. In some of the figures shown it will be seen how easy it is for a row of stitches to become double and then to add or to make additional rows at the ends or on the sides, to separate lines or to give to a line any sort of curved effect. This is especially noticeable in fig. 3. The line may pass by further additions into rectangles, triangles, or geometric figures. The Indians of the southwestern portion of the United States have exhausted the situation in this matter of meandering lines.

(*b*) *Squares or rectangles.*—The next simplest form upon which the basket artist may venture is the square or rectangle, which may be a band of two or more rows interrupted by vertical spaces, perhaps in another colour. It is a matter of counting the same number over and over as the work progresses, and is one of the first steps in arithmetic. In a Pomo gift basket the square patterns on the bottom are the mats on the floor, and so the simplest of weaving motives lends itself to symbolism. In the plainest forms of work the checkers or squares are oriented at right angles to the horizon or border of the specimen. Variety is effected by the position of the squares and their relation one to another and to other decorative elements. A delightful effect is produced on matting, especially where the squares or checkers are oblique to the borders. Such work is to be seen in America, but was much more common in the islands of the Pacific.

The rectangle gives a wider scope still to variety in artistic effects. Bands of rectangles are to be seen around basketry, and more complicated forms are made up of them or have them in their composition. A departure from the rectangle, but in the same line of workmanship, is the parallelogram. Such

work is easily produced in the diagonal or twilled weaving. An excellent example of an intricate design made up of rectangles in various positions and relations one to another is shown in the old Skokomish wallet from Washington in the collection of Fred Harvey (see Plate 51). The decorations on this wallet consist of vertical collections of geometric figures, one hanging from another, in suits of four. Each one of the designs which go to make up the whole decoration in its simplest elements is a rectangle. The projections from the sides of these are the same, and the wolves around the upper border are simply a collection of the same elementary design—the head, the neck, the body, the legs, the tail, each one is the same. On the larger rectangles are nests of geometric figures of the same class, one inclosed in the other by widening lines. The entire effect on the surface is produced by the clever use of a single element.

In many examples, when the rectangular figure is set obliquely, the pattern of the basket appears to have a rhomboidal form. The types of weaving have much to do with the administration of the rectangle, whether it be radial or concentric. In diagonal weaving the long axis is horizontal, but in coiled work the long, slender rectangles are perpendicular. In loose coiling the figures become rhomboidal on account of the longer slope of the stitch. Twined work produces an infinite number of rhombs in rows having ragged edges. In the style of weaving produced by the Makah, the separate elements are rectangular on the inside, but they form a charming patchwork of rhombs on the outside. The rectangle, aside from colour, which will be studied later, lends itself to ornament by its relief, its proportions, and its position. The relief depends on the material, which may be soft inner bark or bast, or pliant leaves. On the other hand, it may be soft fillets of ash and stems of willow or coarse brushes, as in the fish weir. When the projecting elements are intractable, the possibilities of plain geometric ornamentation are limited in the extreme,

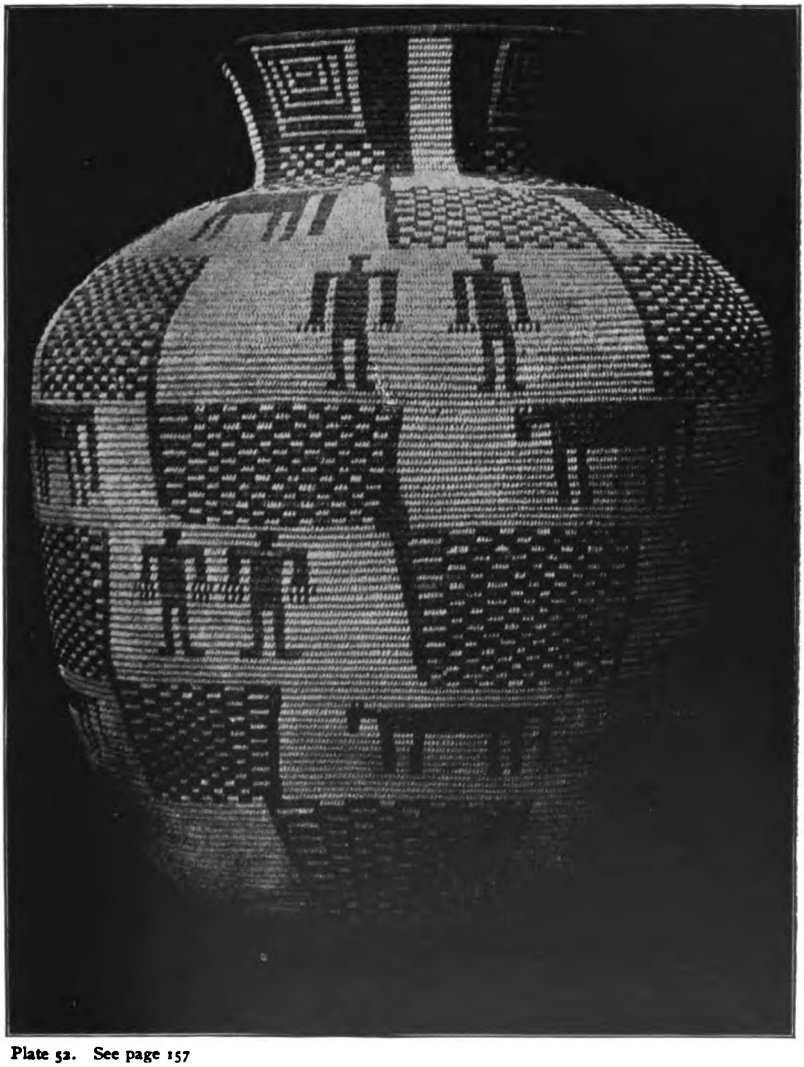


Plate 52. See page 157

LARGE APACHE OLLA, ARIZONA, DESIGNS IN RECTANGLES

Collection of F. S. Plimpton

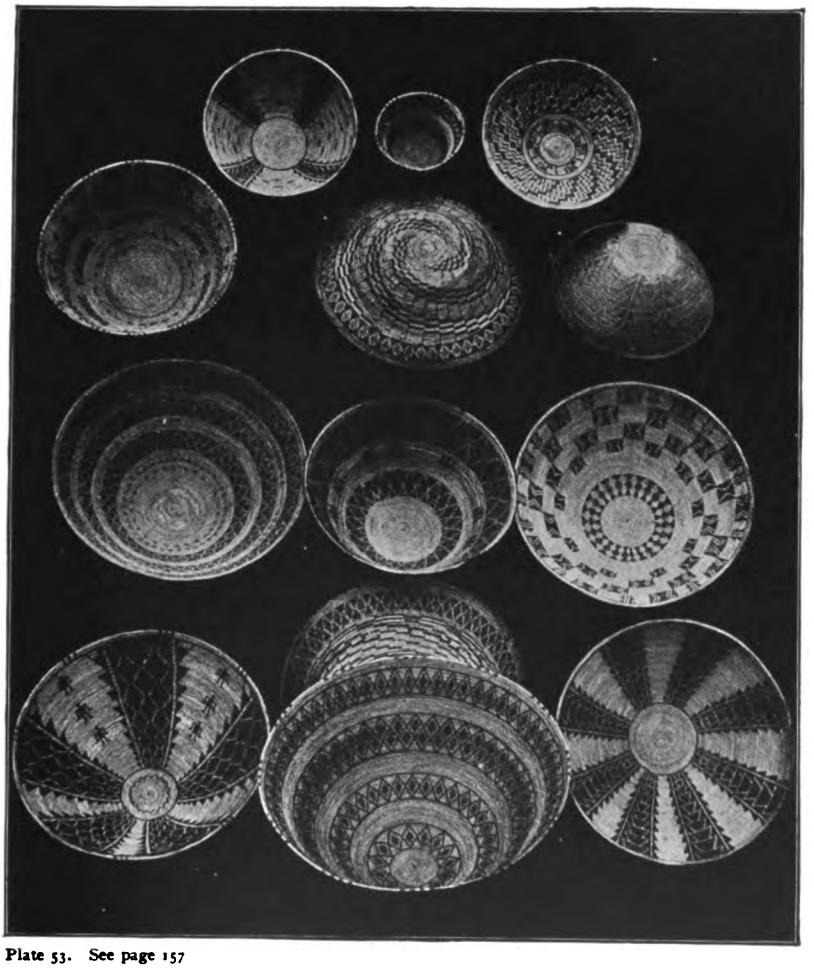


Plate 53. See page 157

FINE COILED BOWLS, KERN, INYO, AND TULARE, SHOWING USE OF DIAMONDS AND POLYGONS FOR ELEMENTS IN DESIGNS

Collection of C. P. Wilcomb

but with fibers highly flexible and well-soaked materials the field of the decorator becomes greatly enlarged.

Plate 52, a large bottle-shaped granary of the San Carlos Apache Indians, belonging to the fine collection of F. S. Plimpton, of San Diego, California, shows what is meant by proportion. Upon the surface of this coiled basket will be found stepped patterns rising in a cycloid from the bottom to the neck and even to the rim of the specimen. Each one of these spaces is covered with black and white rectangles, or as near as rectangular forms can be made on a globular surface governed in length and width by the widening or narrowing of the specimen. In the spaces between these patterns so made up are men and horses, but even these have square heads, bodies, legs, and feet. The fingers on the men are in proper shape. An amusing departure is manifest in the effort to give a little shape to the tails and ears of the horses.

(*c*) *Rhomboidal figures.*—With the parallelogram or rhomb, the surface of the basket has a tessellated or mosaic appearance. These figures also may be oriented with reference to the borders, but the patterns become oblique, and more pleasing diaper effects are caused when the figures are not oriented with reference to the horizon or border. Plate 53 shows a number of beautiful bowls in the collection of C. P. Wilcomb, from Kern, Inyo, and Tulare counties, California. They are introduced here for the purpose of showing how, on many of them, diamond-shaped patterns have been worked into basketry with excellent effect. Associated with these geometric forms, polygons are also the elements of cycloids covering almost the entire surface. Radiating from the bottom, triangular spokes proceed to the outer margin, and these are decorated with diamond patterns and irregular polygons. The human form and other typical patterns are united with those now under consideration. The majority of the decoration, however, is in the simple elementary geometric shape here considered.

(*d*) *Triangles.*—On the surface of basketry the triangle, as an element of design in mosaic, does not occur in the single stitch or check, but it is found in openwork basketry, as among the Aleuts, where the warp is bent backward and forward or crossed. By the combination of elementary parts triangular effects in a great variety are obtained. In this technic a triangle is not a three-sided figure with straight outline, but a pyramid made by piling up rectangles, vertical or radial in coiled basketry, horizontal or concentric in woven basketry. The base of the triangle may be straight, but the sides are notched and stepped as in the beadwork.

A great many symbolical designs of arrowheads, mountains, and other artificial and natural objects which suggest the three-sided form, are produced on both coiled and woven basketry, the base of the triangle being at the top, at the bottom, or on either side of the figure. The conical or the globular basket lends itself most cheerfully to this element in design. On cylindrical, and especially on vertical vasi-formed basketry, for ornamental effects the triangle easily passes into curved figures of infinite variety. After the foundation of the figure is laid on a certain round of weaving or coiling, it is possible on the next round to widen or narrow above either end of this line. In some examples a sweeping cycloid, beginning at the base, narrows and curves to the right or left, terminating with the outer border. The Filipino hat-makers are exceedingly fond of creating a series of these triangle cycloids in different colours, some of them turning to the right, others to the left. The California basketmaker also produces flame-like effects with elongated triangles. There seems to be no end to the versatility of this figure on globular basketry.

Plate 54 represents two of the finest bowls in the collection of F. S. Plimpton. The upper figure is a Tulare, and shows in its bands of decoration in brown and black how the rhomb and triangle coöperate to produce regular and pleasing decoration. The lower figure is a so-called Mono, made by a Nim

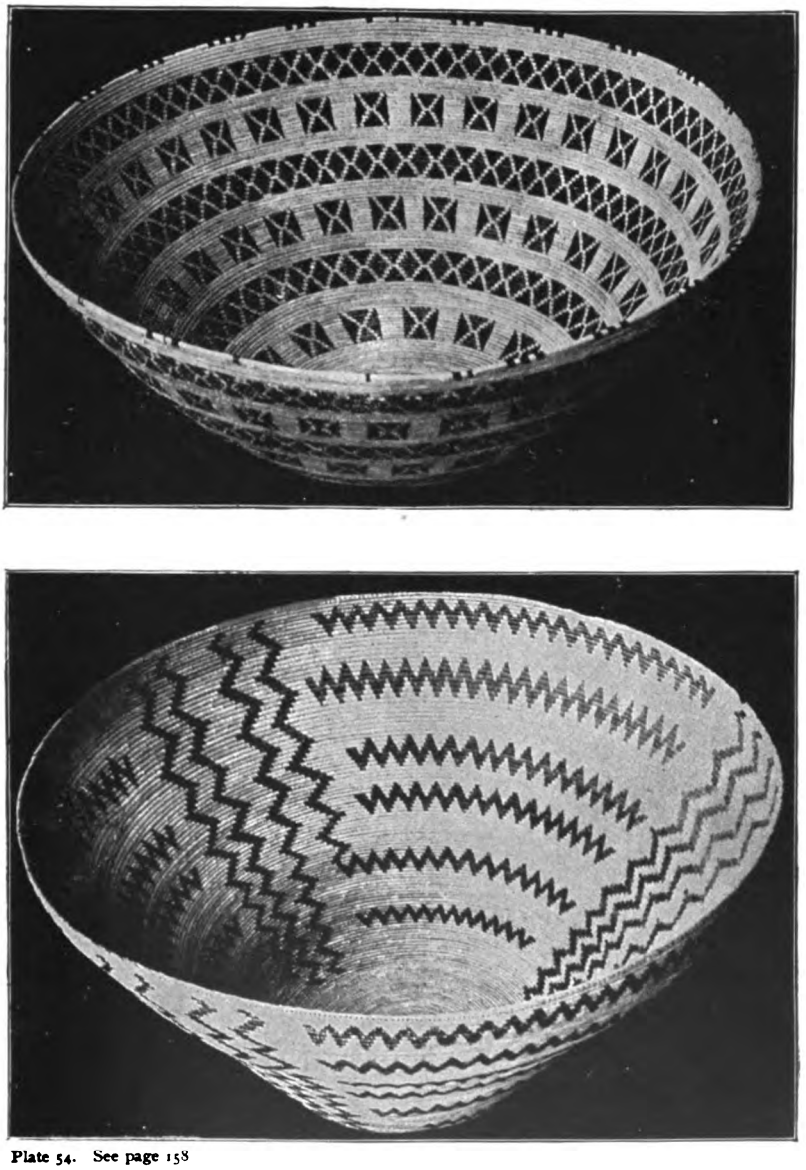


Plate 54. See page 158

TULARE AND MONO COILED BOWLS, CALIFORNIA

Collection of F. S. Plimpton

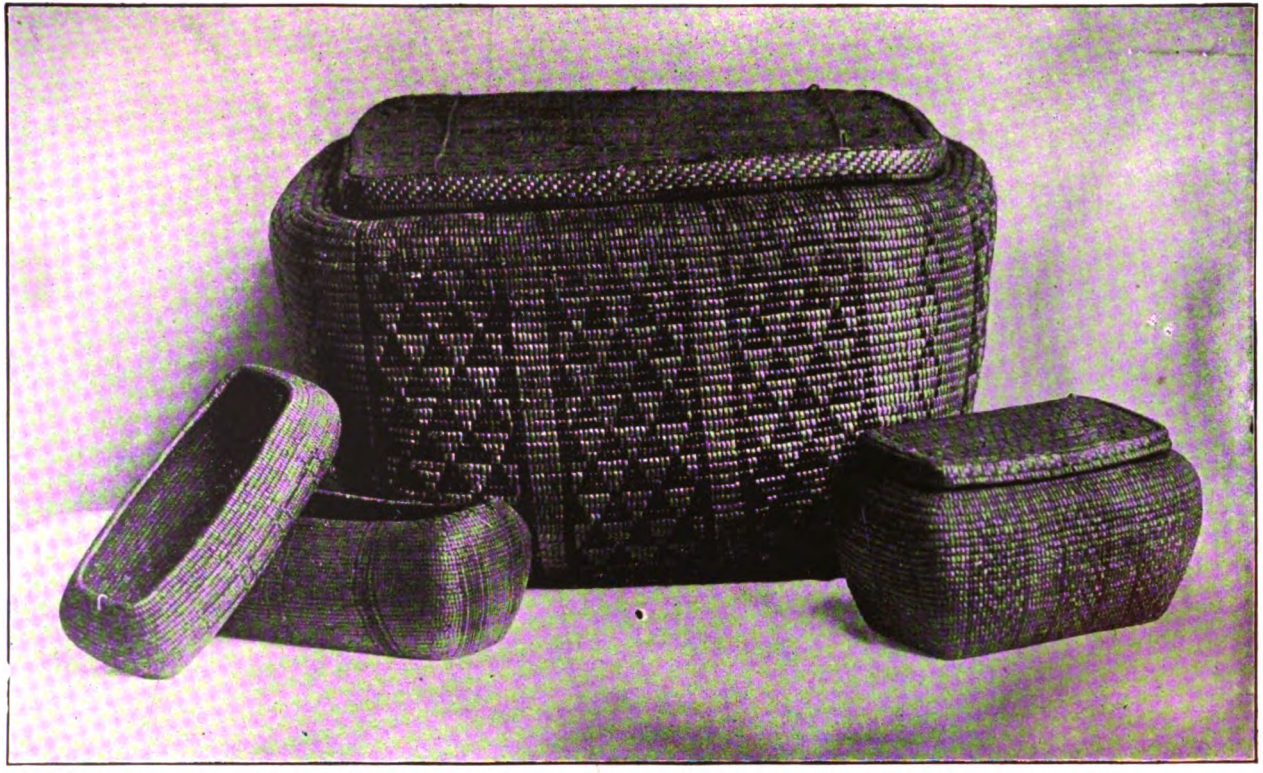


Plate 55. See page 159 IMBRICATED COILED BASKET, USING DARK AND LIGHT TRIANGLES IN DESIGNS, MAIDU INDIANS, CALIFORNIA

Fred Harvey Collection

Shoshonean woman, and is a still better illustration of the use of narrow parallelograms, combined in lines concentric and radial, to give expression to phenomena such as lightning.

Plate 55 is an imbricated box from the Fraser River country in British Columbia. Excepting the parallel bands, the front and body of the basket are covered with white and dark-brown triangles, no other elementary geometric figure being introduced. Each triangle is an example of the limitations before mentioned, which practically cut the basketmaker off from free-hand drawing. The geometricians say that a circle is a polygon with an infinite number of sides. With them, all curved lines resolve themselves into the rectilinear. The basketmaker does not stop there, but resolves rectilinear forms into still minuter rectilinear forms of another class. The mosaic elements on the basket are most regular squares of imbrication. There is for her no other way to make a triangle. This specimen is in the collection of Fred Harvey.

(*e*) *Polygonal elements.*—What has been said of the triangle is also true of polygonal figures—that is, of those having more than four sides. These figures may be produced in the texture of baskets in openwork. They are also brought about by uniting different forms of checks or stitches in the same piece of work. On the hats of the Haida Indians and on twined work of the Pacific coast excellent diaper patterns are woven. In closely packed basketry the individual stitches assume the form of the hexagon, after the manner of the bee's cell. On matting, wallets, bags—that is, on flat surfaces—all of the geometric figures before mentioned having straight borders occur. In many rhombs the ends are cut off by boundary lines of bands and turned into hexagons.

However, as soon as basketry begins to assume curved outlines, borders that would be straight on a flat surface are bent in one or more directions. The effect of this, both in the single mosaic element and in the larger designs, is to change the figure from a hard outline to one that is far more graceful.

In a coiled basket the foundation coil is curved horizontally, but the stitches cross these at right angles. In a coiled bowl with globose bottom there are three sets of curves with different radii—the horizontal curve of the foundation, the curve of the pattern, and the vertical curves of the stitches. The shapes of polygons that may be worked on the surface of basketry are legion. The designs which may be made out of these are even more numerous. It will be possible to illustrate only a limited number of them, but the reader may be pleased to turn from plate to plate in the decorations on the surface of basketry in the various chapters to see how versatile the Indian woman's mind was in making the best of her limitations. Being confined to angular elements, having no opportunity to introduce the curve except so far as the body of the basket itself made straight lines curved, it became necessary to rack her ingenious brain to satisfy her cravings for expression of the beautiful with straight lines only (see Plates 56–59).

(*f*) *Complex patterns.*—The most striking artistic effects in basketry are realised when the simple lines, bands, and geometric figures are united and modified to suit the weaver's fancy, to fit the general shape of the object, and oftentimes to correct a miscalculation on the part of the maker. The effect of lines is changed by breaking, curving, setting at different angles, widening, and colouring. Geometric figures become subsidiary to and are lost in mythological compositions, but they are the organic parts of the whole design.

Plate 60 will illustrate what is said about the production of intricate designs by combining two or more of the separate elements in the foregoing paragraphs. In every one of the bowls shown in this plate a circular form in basketwork is attained by using material of the same colour in the coiling at the bottom. From these central beginnings designs in triangles, squares, rectangles, and polygons are built up into labyrinthian decoration for the whole surface. In the middle figure of the bottom row five patterns radiate from the central

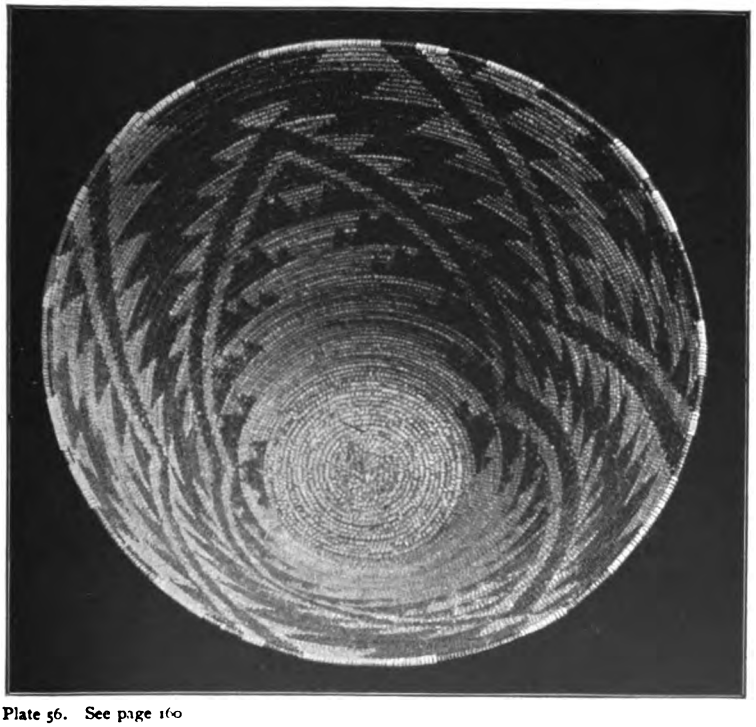


Plate 56. See page 160

COILED BASKETS OF THE MAIDU, CALIFORNIA. DESIGNS MADE UP OF SIMPLE GEOMETRIC FIGURES

Collections of U. S. National Museum

circle, each one of which is made up of three groups of rectangular figures in black and white. Specimens are in the collection of J. W. Benham.

Plate 61 will interest the student as an example of bold design, being the American eagle, with expanded wings. It will surprise him to note how, with the use of straight-line figures before mentioned, some little life is given to the neck and to the talons of the bird by the fine markings of stitches, which lend themselves somewhat to curved effects. It can not be said, however, that this treatment is a success.

Ornamentation through Colour

Quite as much as form, the colours in basketry are an element of beauty. As in basket forms the sense of pleasure is awakened by the mass, by the minute elements, and by the shape of patterns or designs, so it is with colours. One does not know which to admire the most—the subdued shades of the natural materials, the pretty effects of the infinite variety of hues in the stitches, or the combinations of patterns in ornamentation through colours furnished by Nature's laboratory, which the importunate Indian women of America have secured in their tireless quest. The gamut of shades runs from pure white through the yellows and browns to sooty black, and age only ripens the effects. The peculiar golden shade of an old piece from California will set the connoisseur's face aglow. No doubt a part of this admiration springs from association of ideas such as age, rareness, the seeming disparity between the maker and her art, and, maybe, the pride of ownership. When it is remembered that for utilitarian purposes merely not one speck of this artistic colouring is needed, and further noted that great fatigue and search and critical judgment are necessary in order to assemble materials for a single basket, surely no one will withhold admiration from the creator of coloured ornamentation in basketry.

One can scarcely begin to appreciate her struggles and triumphs until the effort is made to reproduce her results.

Ornamentation by means of colour is effected in basketry through the following processes, already hinted at in the chapter on basket-making:

(*a*) By employing materials which are of different colours by nature. This has been partly described in the foregoing sections.

(*b*) By the use of dyed materials.

(*c*) By overlaying the weft and warp with thin strips of pretty materials before weaving, or by wrapping strips about them in various ways.

(*d*) By embroidering on the texture during the process of manufacture, called false embroidery.

(*e*) By covering the texture with plaiting, called imbrication.

(*f*) By adding feathers, shells, beads, and other ornamental objects.

In the making of designs on basketry, dyeing, overlaying, false embroidery, and imbrication are merely artificial methods of repeating and heightening the decorative effects already shown to be possible through use of materials in their native colours. No new designs are added, symbolical or otherwise. The effect of new forms in elementary technic has already been mentioned. But the artist obtains an immense advantage in the number of colours as well as the richness of shades and harmonies. After all, excepting in California, there are only a few colours in tough fibers to select from in any area. If it were not for pretty grasses, which have brilliancy of colour but little tenacity, and the bright dyes in mineral and vegetal substances which have no value as textiles, the esthetic power of basketry would be greatly curtailed. There are two or three small linguistic families of Indians in California that seem to have gathered unto themselves every kind of basket decoration. As in the island of Crete, the culture of the

Plate 57. See page 160

COILED BASKETS OF THE MAIDU, CALIFORNIA. DESIGNS IN GEOMETRIC FIGURES

Collections of U. S. National Museum

ancient peoples about the eastern Mediterranean seemed to have assembled, so in the Pomo and Mariposan tribes of Indians the composite art reached its climax of decoration. Is it not marvellous that here, hundreds of years ago, perhaps, broke out the first basketry epidemic; not as now resulting in a fever to own them merely, but manifesting itself in a passion for making them. In the chapter on uses it will be seen that this passion was intimately related to the most sacred feelings that dwelt in the soul of the maker, namely, those associated with the spirit world. It is also true that the natural materials for other forms of art expression were lacking or not courted.

(*a*) *In natural materials.*—Colour in basketry is effected, first, by the materials from which the structure is made up. In the Aleutian Islands the ware is in the colour of the wild grass stalks, unripe and ripe; farther south the spruce-root decides the shade, and in British Columbia cedar root and bast and bark give a brown or white appearance to the ware. In eastern Canada, ash splints are white and brown; so are the baskets made therefrom, but the cane of the southern States has a glossy yellow-green surface, and that predominates in Cherokee and Choctaw ware.

Among the bewildering varieties of baskets between British Columbia and Mexico the foundation colours will be decided by that of the Indian hemp, spruce and cedar root, bulrushes, cattail stems, shoots of willow and rhus, roots of sedges and agave, roots of yucca, and so on.

In this connection it must not be overlooked that these same materials are not lacking in responsiveness to the severest esthetic demands of the artist. The Abenaki woman knows that last year's growth of black ash is almost as white as snow, while the rings of growth farther in are brown. She therefore makes warp of one and weft of the other, or bands of them alternately, much to the embellishment of the surface. The commonest fisherwoman on the coast of British Columbia will show you that cedar root has three colours—that of the woody

portion, the brown of the outer bark, and the newest wood nearest to the bark. She also knows how to overlay with grasses. The California cercis, or redbud, has a pretty reddish-brown bark, but the wood inside is pure white. Remarkable suggestiveness to a wide-awake mind exists in the yucca leaf of the Southwest, which may be used in basketry, whole or split. The outside is mottled green in a number of shades, while the inside is white. The leaf of the yucca (*Yucca arborescens*) is green, the root a reddish brown.

Holmes calls attention to the possibilities of esthetic effects in a single colour shown in a work-basket from the ancient cemetery of Ancon, Peru, produced through variety in the management of diagonal weaving. There will be found on all these work-baskets (1) ordinary diagonal weaving, over and under two or three or more; (2) bands of greater or less width formed by laying a piece of wood or cane between warp and weft and then continuing the weaving on the other side; (3) the forming of hinges and ridges by twining in each weft element about two or three warps before continuing the weaving. The herring-bone effects are produced by leaving in front alternately warp and weft in the padded bands. If the number of rows of common diagonal weaving is even, a herring-bone effect is seen; if odd, the checks in the two rows will be parallel. In Mexico and Central America the valuable yuccas give colour to all textiles, as do the palm leaves in South America. (See figs. 207–209.)

It is said that the Japanese, in sawing up logs, will keep the planks bound together until the workman is ready to use them, and when the carpenter places them in a ceiling or a piece of furniture he is careful to have the ends abut on each other as they were together in nature. The grain, in such case, fits and produces odd but pleasing forms. In the same way the basketmaker, by showing discretion and taste with roots or stems of different shades, succeeds in producing cloud effects upon the basket or mat. So nature comes in to the assistance of the Indian woman in her elementary steps. She

does not start out with the design in her mind which she will produce in colour, but by using the coloured elements she is able to get her effect with less forethought. Indeed, it can be seen that in such a way the earliest thoughts of beauty might have been awakened.

Plate 62 shows two coiled Mission baskets in the collection of G. Wharton James; the upper one is 10 inches and the lower one 11¾ inches in diameter. They are made of rush, but the interesting feature for which they are introduced here is the design—the upper figure might be called the keystone pattern, the body of the bowl having two zones of patterns in brown and black material, each one made up of wedge-shaped figures, narrow on the inside and widening outward. These patterns are in four parts, each one surmounted by a middle piece extending two rows beyond the next pair and each pair of the series ending two rows nearer to the center. They are of equal width. A narrow wedge separates the four groups. Between the zones is a band of white preserving the outline of the border. The lower figure is a five-pointed star, the border of the segments being curved as in the orange-peel pattern. The central figure might be called a sun design, which, though it be modern, shows the adaptability of the Indian mind to invasion by suggestion.

A second step in colour resources, without going away from the natural and necessary structural elements, is in the use of different materials. Very few areas in the Western Hemisphere are so poor in resources as to have only one good basketry plant. On the Great Lakes, ash, hemp, and sweet grass are white, brown, and green; in the Southwest, rhus is white and martynia is black; in California, willow is woody white; cercis is red outside and snow-white inside, and at least one sedge has black root, and the yucca a red one. Most dainty effects are secured in coiled basketry by sewing with strips from quills of flickers and other highly coloured birds. Not to pursue the statement too far, it is only in

Alaska and the Strait of Magellan that the body of our textile does not contain varied material.

The moment a savage woman has in hand these variegated substances, her fancy is emancipated. Warp may be of one plant and weft of another, either in plain checker or in twilled weaving. Wickerwork is not entirely irresponsive to the opportunity. In twined weaving the two strands of the weft may differ in colour, so that the result will be the mottled line. If the warp stems be odd in number, then on the next round the colours on vertical lines will not match. With these simple resources the basketmaker may play an unlimited number of melodies. An excellent example of lines in simple and two-colour effects from southeastern Alaska is shown in coloured Plate 67.

But the ambitious artist is not satisfied with flecked lines and mottled surfaces, and broad bands in one colour. Her bands are divided into rectangles, triangles, and rhomboidal elements. The zones of element are widened and the geometric patterns composing them are multiplied and variegated. Those who have large collections may have noticed how the several styles of technic behave in this regard. Checkerwork is little restrained, so also are wicker and twilled ornamentation; but in twined and coiled ware the case is entirely different. Plain twine and the Pomo tee work venture little beyond the banded ornament. The same is true of most coil types; but the twilled or diagonal-twined work and the three-rod coil leap over the parallels and spread themselves out in bewildering cycloids of coloured patterns, or, keeping to the angular elements, the weaver covers a large surface with fretwork in endless variety. All of this is wrought into the structure of the basket in the substantial everyday materials, which possess tenacity and colour as well. Quite a number of tribes in the southwestern United States use no superadded material or dyes whatever, and yet the tribes of the Piman family excel all others in the endless variety of fretwork on their basketry,

Plate 58. See page 160 PIMA COILED BOWL, ARIZONA. EXTRAORDINARY USE OF PARALLELS IN DESIGNS
Collection of C. E. Rumsey

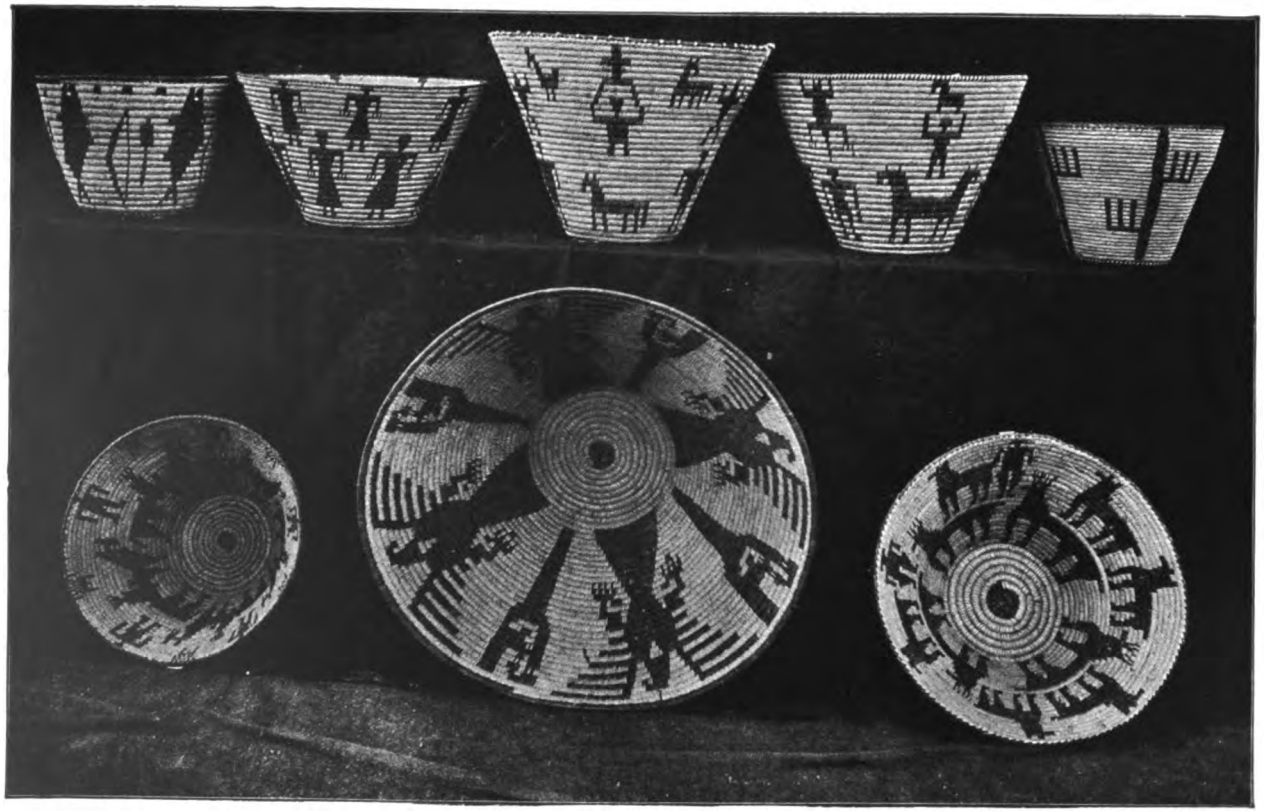


Plate 59. See page 160 COILED BOWLS OF PIMAS, ARIZONA. CONVENTIONAL PATTERNS FOR OBJECTS WITH CURVED OUTLINES

Collection of J. W. Benham

produced with splints in wood colour and the undyed splints from the pod of the cat's claw, or *Martynia louisiana*. (See Plate 63.)

(*b*) *By dyeing*.—The colours of natural textile materials were still further diversified with dyes and paints, the latter either stamped, stencilled, or applied freehand. At the present time, the cheap and obtrusive dyes and paints of the trades supplant the aboriginal and more attractive substances. The latter have also become more difficult to procure as civilisation has preëmpted the ground.

The artificial colouration of basketry material was known to the American savages in pre-Columbian times. For mineral dyes they used earth colours, burying the splints in different soils, where they acquired permanent shades. Vegetable dyes were known from Alaska southward everywhere. The substances used were such as have the power of directly fixing themselves within the texture of the basket material. It is true and also interesting to note that certain of the processes of the Indians in dyeing their basketry materials were, all unconsciously to them, foreshadowings of the later and more complicated processes in which a mordant is employed to fix the dyestuff in the materials. The Indian had no appreciation of how the causes were produced. They discovered the fact, but their theories would lead into dreamy myths in which the personeity of the dyestuff would be the prominent characteristic.

Plate 64 shows twilled basket No. 76,778, U.S.N.M., from the New Orleans Centennial Commission. It is a basket of the Chetimacha Indians of Louisiana made in split cane in the natural colour and dyed. The union of textile effects and the three colours—orange, black, and straw colour—are most pleasing, the motive being ellipses and rhombs, made by the use of small squares and rectangles. The upper portion on the figure also shows how a diaper effect may be produced on the surface by the lights and shades of the uncoloured material.

It is useless to tarry about the eastern basketmakers in

search of native dyes. There is no doubt of their having possessed them. The porcupine quill workers about the Great Lakes and all the way to the Arctic circle are still adepts in the art. In the National Museum are little wallets of bladder from Anderson River, Canada, each one filled with porcupine quills dyed in a separate colour.

The basket-weavers of Yakutat Bay, in southeastern Alaska, colour with dye from the willow their splints of spruce-root from which they weave their twined basketry. They scrape the roots of willow and make a decoction in a wooden tub, in which they soak the spruceroot splints. Their neighbours of the same linguistic family had a more extensive laboratory in colour. For more than a hundred years they were in contact with the Russians and from them obtained good dyestuffs and knowledge of processes. Many an old piece of their basket ware, although it has stood hard use in all the years, and in spite of all, has grown more beautiful with age.

Plate 65 shows two covered baskets of the Tlinkit Indians, in twined work, which are inserted here for the purpose of exhibiting the influence of modern traffic. Cæsar, in his Commentaries, speaks of the Belgians as being the most manly of all the Gallic tribes, because merchants less frequently went among them and sold them the things that tended toward effeminating their minds. The Mercatores have also been among the tr bes of the Northwest. On the right-hand basket even the bands that would show some little survival of the ancient wood colour have been dyed, while the red, yellow, black, and white shades are in aniline. The form of these baskets is also borrowed from civilisation, and the handles in braided ware are not aboriginal. Cat. Nos. 168,267 and 168,268.

The wood of the alder, when freshly cut, says Swan,* is soft and white and easily worked, but a short exposure to

* The Indians of Cape Flattery, Washington, 1870, p. 43.

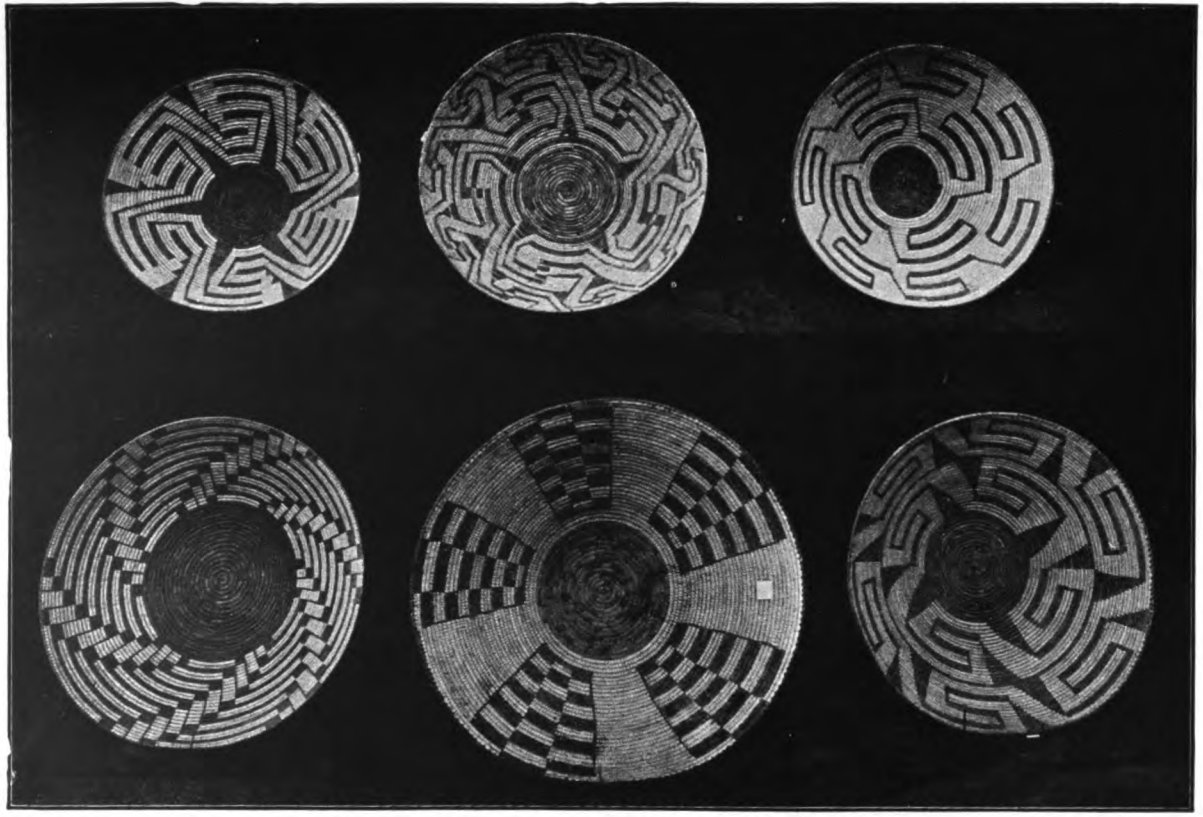


Plate 60. See page 160

OLD COILED BOWLS, PIMA, ARIZONA. MIXTURE OF GEOMETRIC ELEMENTS IN COMPLEX DESIGNS

Collection of J. W. Benham

the air hardens and turns it to a red colour. The bark, chewed and spit into a dish, forms a bright-red dye pigment of a permanent colour, which is used for dyeing cedar bark or grass. Governor Dagget, writing of the Indian women on the Hupa reservation in northwestern California, uses almost precisely the same language with reference to making a dye-pot of their mouths. The processes of weaving there are in twined work, and suggest connection with the Washington State tribes.

The Navaho Indians, according to Washington Matthews, employ native dyes of yellow, reddish, and black. In their blankets they have also wool of three different natural colours, white, rusty black, and gray. The black dye is made from the twigs and leaves of aromatic sumac (*Rhus trilobata*). They put into a pot of water leaves and branches of the sumac. The water is allowed to boil five or six hours. Ocher is reduced to a fine powder and slowly roasted over a fire until it assumes a light-brown colour. It is then combined with an equal quantity of Piñon gum (*Pinus edulis*), and again the mixture is placed upon the fire and stirred. The gum melts and the mass assumes a mushy consistency. As the roasting progresses the mass is reduced to a fine black powder. When it has cooled it is thrown into the decoction of sumac, with which it forms a rich, blue-black fluid. This is essentially an ink, the tannic acid of the sumac combining with the iron of the ferric oxide in the roasted ocher. The whole is enriched by the carbon of the calcined gum.

Reddish dye is made from the bark of the *Alnus tenuifolia* and the bark and root of *Cercocarpus parvifolius*, the mordant being fine juniper ashes. These dyes are now applied by the Navaho. The so-called Navaho blankets are in three colours.

For yellow, the flowering tops of *Chrysothamnus graveolens* are boiled about six hours, until a decoction of deep yellow is produced. The dyer then heats over the fire some native

alunogen (native alum) until it is reduced to a pasty consistency. This she adds to the decoction and puts the whole in the dye to boil. From time to time a portion is inspected, until it is seen to have assumed the proper colour. The tint produced is nearly lemon yellow.

Julian Scott makes the statement that the Coconinos or Havasupais in northwestern Arizona use only black in the ornamentation of their basketry, while the Apaches and Walapais use black and red also.

(*c*) *By overlaying.*—This process of ornamentation consists in laying a strip of pretty grass, dyed or in the natural colour, on the outside of one or both the strands in woven or coiled weaving. It is virtually furnishing a dull-brown strip of root with a bright-coloured bark. By this ingenious combination beauty and strength coöperate in the result. The weaver has it always in her power to twist the strands so as to hide this bark side or bring it into view. The Hupa Indians especially, but also many other tribes in northern California and northward, do the weft of their beautiful twined weaving in sombre materials. The men are most adept in lining the backs of their bows with sinew shredded and mixed in glue. In a similar way, as if one had suggested the other, they line the back of the weft strands with bright straw. It is not glued, since the weaving would hold it in place. When the Hupa reveals the straw side of the strand at every half-turn, she covers the surface of her basket with straw colour which turns to gold with age. The overlaying of only one of the two weft strands gives a freckled effect on the surface. In some of the tribes the pattern does not show on the inside.

This will be a good place in which to mention a kind of overlaying common in countries where the cane abounds. The outside of the stem is glossy and may be dyed. The inside is spongy and unattractive. By laying two strips together, so that the smooth surface may be outward, there would be really a double fabric with two glossy surfaces. The

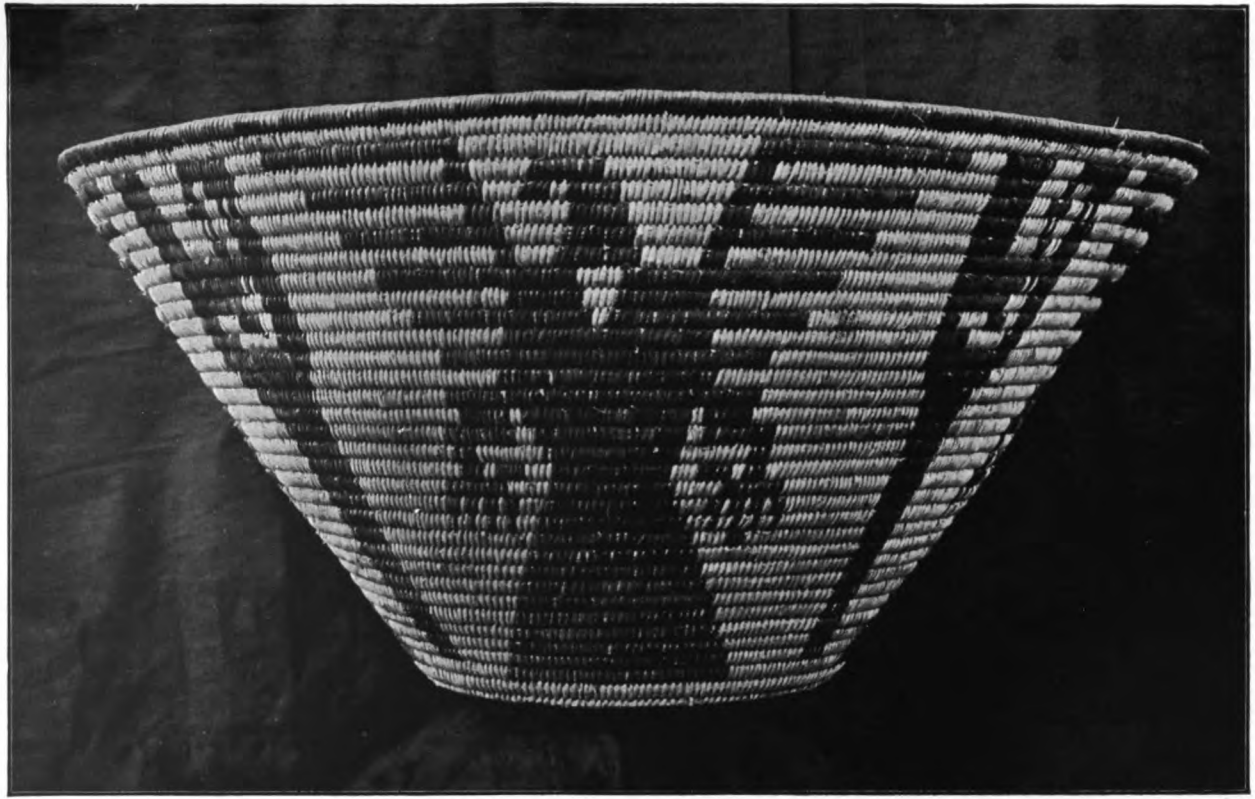


Plate 61. See page 161 COILED BOWL OF THE PIMAS, ARIZONA. ENLARGEMENT OF EAGLE ON PLATE 59

Collection of J. W. Benham

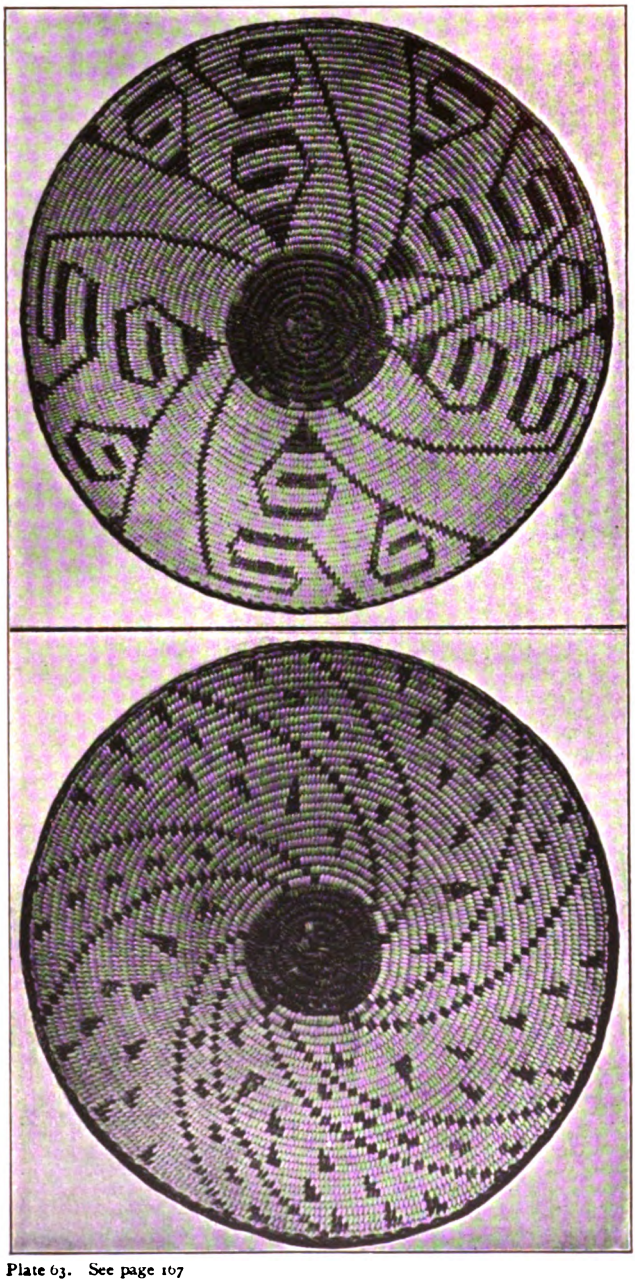


Plate 63. See page 107

BASKET BOWLS OF THE PIMAS, ARIZONA. DESIGNS IN NATURAL COLOURS

Collected for the Bureau of Ethnology, by Frank Russell

southern Indians also frequently passed only one of the pair of splints over or under weaving.

Fig. 101 shows a style of wrapping done in Mexico City.* The illustration is from a hand wallet. The body of the checker weaving is in hard, flattened straws of varying shades. Each warp straw is wrapped with two fillets of thin material in darker colour so as to leave small squares on the surface set diagonally. When the plain weft is run among the warp elements, the surface of the fabric is covered with larger and smaller squares in white set in triangles of darker material. The white squares run diagonally across the surface. There are endless variations produced by this wrapping added to the body of the fabric.

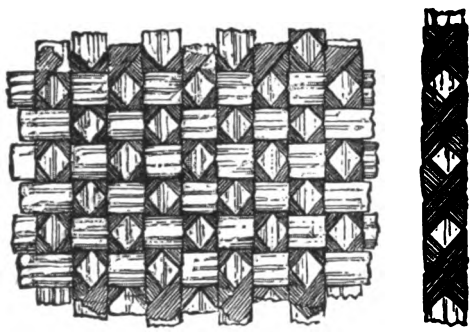


FIG. 101.
WRAPPING WEFT FILLETS WITH DARKER ONES.
After W. H. Holmes.

This overlaying must not be confounded with the many tricks which cunning women play with the strands of the regular twined weaving, which are frequently of brilliant straws of squaw-grass and other pretty materials. (See Plates 146, 164, 170, 177, and 178.)

Plate 66 represents twined basketry of the Klamath River Indians of various types, and is here introduced for the purpose of showing how the tough weaving material may be overlaid with basketry and other coloured filaments so as to conceal the foundation both outside and inside. It has been shown in the chapter on processes, however, that the exposure of the overlaying material need not occur on the inside. These specimens are Cat. Nos. 204,258, collected by Mrs. Carolyn G.

* The Indians of Cape Flattery, Washington, 1870, p. 43.

Benjamin; and Nos. 19,286 and 19,282, collected by Livingston Stone.

Akin to the "beading," so common in the Fraser River coiled basketry to be mentioned, is an ornamental effect produced in twined work by the onlaying of coloured straws in regular geometrical designs and catching the angle under the strand of the weft. Holmes* figures an example of this from the Klamath Indians in northeastern California—a rare process in North American basketry. (See fig. 102.) It reminds one of the stamps for printing tapa cloth used in the Polynesian area.

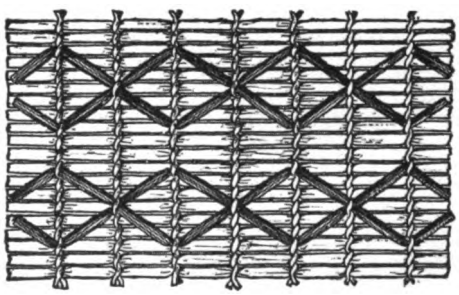


FIG. 102.
BEADING ON TWINED WORK.
Klamath Indians.
After W. H. Holmes.

Beading is the insertion of narrow strips of pretty grass or other material into the sewing of coiled baskets, passing it under one, over the next, and so on. Plain beading produces a broken line of dark and light colour alternating, and shifts the direction of the elemental figure from vertical to horizontal. If several rows are made, figures are produced by the process of twilled weaving. The basketmaker may pass her filament over and under as many stitches as she chooses; she may make the element of any row immediately over those of the preceding row, or they may alternate. The Fraser River Salish are adept in this on many of their imbricated baskets. Especially on the ware whose coils have flat foundations is beading effective. (See fig. 103.)

(*d*) *False embroidery.*—This is a method of ornamentation

* W. H. Holmes, Sixth Annual Report of the Bureau of Ethnology, 1888, p. 227, fig. 330.

Plate 66. See page 171

OREGON AND CALIFORNIA TWINED BASKETRY

To show how decoration is produced by overlaying the dull foundation with bright materials

Collected by Mrs. Benjamin and Livingston Stone

in which the outer surface of a twined basket is covered wholly or in part with designs, but they do not show on the inside. The Tlinkits excel in this, calling it uh tah yark tu twage (outside lifted up and put around). It has the appearance of being sewed on after the weaving is done. The process is described on the next page, and many figures in this work show examples of it. Plates 71 and 74, in colour, demonstrate more plainly how effective false embroidery may be made. The body of all Tlinkit and Haida ware is in dull-brown shade of

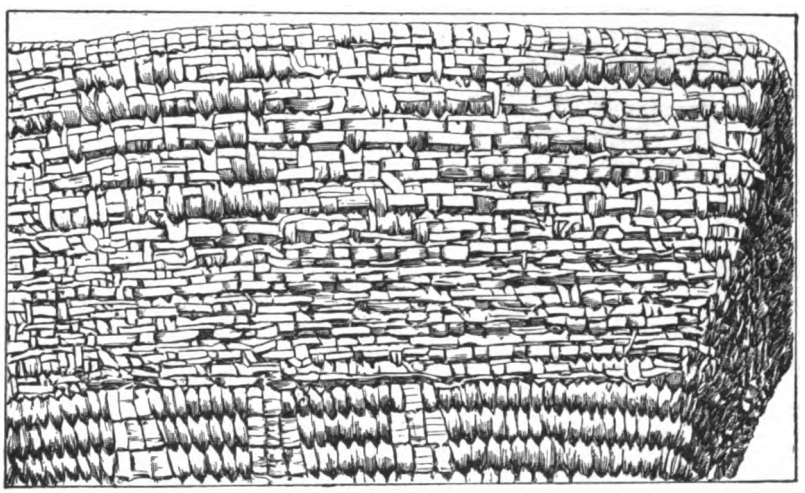


FIG. 103.
BEADING ON COILED WORK.
Clallam Indians, Washington.
Cat. No. 23,512, U.S.N.M. Collected by J. G. Swan.

spruceroot. The saving feature which lends itself cheerfully to ornamentation is the pliability and even fiber of the young roots. Nothing can be more pleasing to the eye than a fine old Haida hat, its surface covered with intricate patterns. The Tlinkit false embroidery in subdued colours, yellow, red, and black, contrasts harmoniously with the cinnamon-brown spruceroot. Also the restful manner in which this work changes the slope of the elements in the weaving should not be overlooked. The twined weaving is made up of a series of little

mosaic elements lying down one upon another like a row of bricks that have fallen. The incline of the stitches in false embroidery is in the opposite direction. In Plate 67, charming effects are produced by alternating the plain weaving and the embroidery. (Emmons.)

The twined false embroidery might be classed technically with three-strand twined weaving. (See figs. 29, 31, and 104.) The warp is in normal position. The weaver selects three strands for weft, two of spruceroot and one of brightly coloured grass. They all have their places in the weaving, but the third, or decorative element, instead of taking its turn to pass behind the warp, remains on the outside and makes a wrap about the strand that happens to be there. The wrapping may pass, also, over two by skipping every alternate twist of the warp. The Thompson Indians vary the mode of wrapping by passing a strip of corn husk or other soft material entirely around the twining each time, showing the figure on the inside.

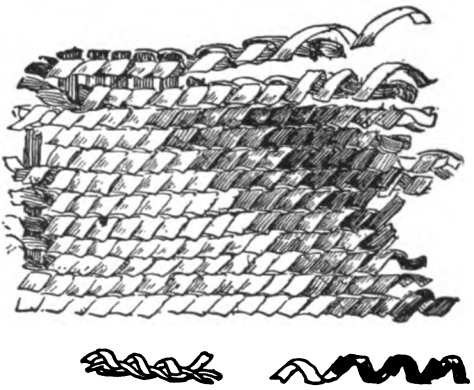


FIG. 104.
OVERLAID TWINED WEAVING.

(*e*) *Imbrication.*—This term, derived from the Latin imbrex, a tile, is applied to a style of decoration used in Washington and British Columbia by the Klikitat and many of the Salish tribes, and most closely allied in technic with the feather-work on basketry farther south. Leaves of *Xerophyllum tenax*, strips of wild cherry bark or of the inner bark of the cedar, in natural colour or dyed black, are laid over the sewing of the coiled work. The juice of the Oregon grape is used to produce a bright yellow dye. The separate elements of the imbrica-

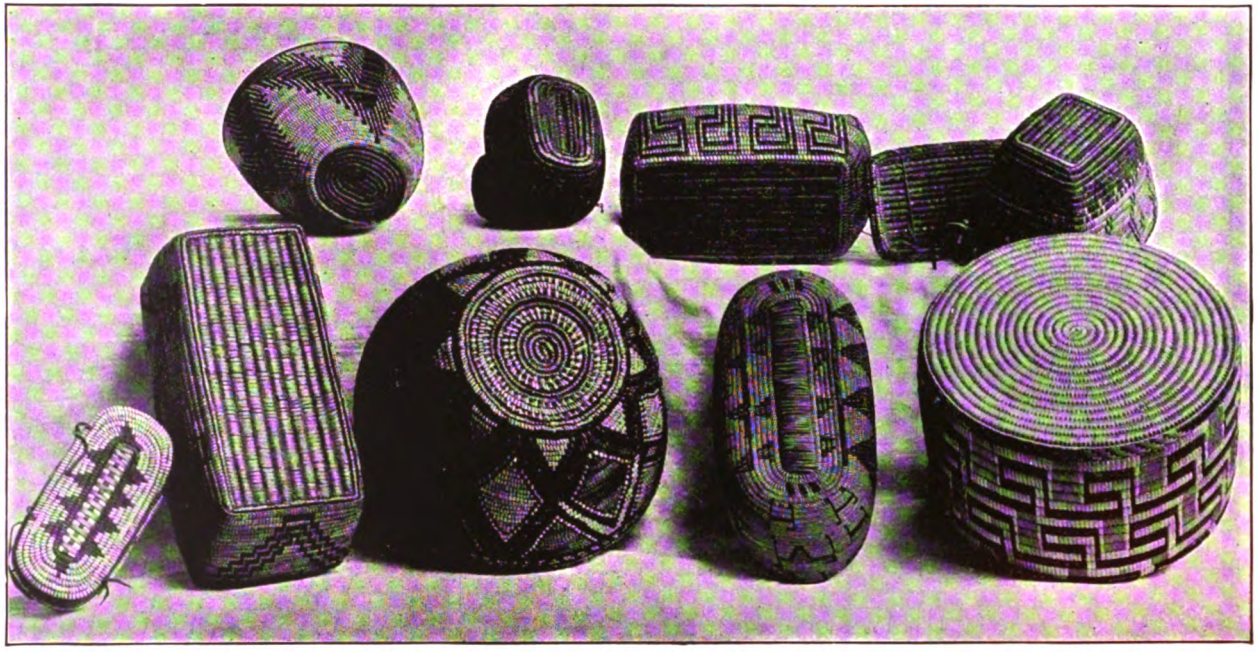


Plate 68. See page 175 COILED BASKETS OF THOMPSON, FRASER, AND LUMMI INDIANS, B. C. ORNAMENT BY IMBRICATION

Collection of Miss Anne M. Lang

tion are squares or rectangles, varying in size with the fineness of the workmanship. But the mosaic effect is most striking, and designs of intricate character are successfully expressed in it. The Salish tribes about the Fraser mouth have learned to widen the coils by using thin strips of wood, often half an inch wide, as foundation of the coil. This increases the size of the imbrications and of the patterns. (See page 99 and Plate 68, also Plates 11, 43, 45, and 55.)

Ornamentation in Thompson River basketry is produced by imbrication and by beading (for detail drawing see figs. 52 and 53 and Plate 102). Imbrication is done by bringing the piece of grass over the outside of the last stitch and forward, then doubling it back and catching the double end with the next stitch. The outsides of Klikitat, Cowlitz, and Thompson baskets are completely covered in this manner, so that the whipped cedar splints can be seen only from the inside. Lillooet baskets have the lower part of the body plain, while the Chilcotin baskets have a separate band in the middle of the body. The grass used is that called Nho'itlexin. It is long, very smooth, and of a glossy yellow-white colour (*Xerophyllum tenax*). To make it whiter, diatomaceous earth is sometimes spread over it and it is then beaten with a flat stick on a mat or skin. The grass is seldom dyed, as the colours are said to fade soon. (Teit.)

(*f*) *Featherwork, beads, etc.*—The California baskets adorned with feathers are called jewels. They no longer serve vulgar uses. The beautiful productions covered with styles of ornamentation before described have often the marks of fire, the stain of berries, the smell of fish about, proclaiming that they were not above combining the beautiful with the useful. The feather baskets sacrifice use to beauty.

The tribes of eastern America have not employed feathers in basketwork in recent times. The nearest approach to it is the porcupine-quill work of the Indians in Canada and the United States. The quills are dyed and set on the surface

of birch baskets by thrusting the sharp ends into the bark. The old historians tell of gorgeous feather robes made doubtless in the Indian fashion of twined weaving, which is akin to basketry. The Eskimo, Aleut, Haida, and Tlinkit do not ornament baskets with feathers, but they do apply in dainty fashion to some of them worsted, hair, and furs. Neither do the tribes of the Fraser-Columbia area. It is the California tribes chiefly that have developed the art, of which they practice two styles. In the one, tiny bits of coloured feather are sewed by their shafts into coiled basketry just to give a hazy effect to the surface. Plate 3 is an excellent example of this. It will be observed that the elaborate pattern in black is not obscured in the least by the feather. In the other process the feathers are laid one upon another so thickly that the surface of the basket is hidden. The addition of so much extraneous matter thickens the foundation and coarsens the work. As previously remarked, the best examples of coiled sewing are not to be found in the feathered baskets.

Plate 69 is a coloured illustration of a feathered basket of the Pomo Indians from Sonoma County, California, in the collection of C. P. Wilcomb. It is examples such as these that technically are called jewels. The foundation is a three-rod coil, the sewing is with split sedge root (*Carex barbarae*), and the stems of the feathers are caught under the stitches. The feathers on this rare specimen are as follows:

Red—Woodpecker (*Melanerpes formicivorus*).
Green—Mallard duck (*Anas boschas*).
Orange—Oriole (*Icterus bullockii*).
Yellow—Meadow lark (*Sturnella neglecta*).
Black—Quail (*Lophortyx californicus*).
White wampum (Kaya)—Disks of *Saxidomus nuttallii*.
Red wampum (po)—Disks of *magnetite*.
Pendants of abalone, *Haliotis* sp.
Long diameter—9 inches.
Coloured plate kindly furnished by C. P. Wilcomb.

Plate 70 is a feathered jewel basket of the Upper Lakes, who are Pomo Indians, in Lake County, California. The stitches are of the coiled work over three rods and interlocked beneath. The yellow feathers are from the breast of Jushil, the meadow lark (*Sturnella neglecta*); the red ones are the throat and scalp feathers of Katatch, the woodpecker (*Melanerpes formicivorus*); and the black feathers at the top are from the crest of Chikaka, the quail (*Lophortyx californicus*). In recent forms, pretty feathers of the peacock and other showy birds gotten in trade are used. The perforated disks are money from the clam-shell, Kaya (*Saxidomus nuttallii*); and the iridescent pendants are cut from Tem, or the hailotis shell, which is quite abundant on the Pacific coast.

The following list of plants used in colouring has been identified by Frederick V. Coville, Botanist of the Department of Agriculture:

Alnus rhombifolia—White alder.
Amaranthus palmeri—Amaranth.
Berberis nervosa—Oregon grape.
Carthamus tinctorius—False saffron.
Covillea tridentata—Creosote bush.
Delphinium scaposum—Larkspur.
Dondia suffrutescens—Sea-blite.
Evernia vulpina—Wolf moss.
Helianthus petiolaris—Sunflower.
Parosela emoryi—Parosela.
Quercus lobata—California white oak.
Rhus diversiloba—Poison oak.
Sambucus mexicana—Elder.
Thelesperma gracile—Thelesperma.
Vaccinium membranaceum—Blueberry.

CHAPTER V

Symbolism

All the high and low
Of my wild life in these wild stems I snare;
The jagged lightning and the star I show;
The spider and the trailing snake are there.

—Anna Ball

All industry leads to fine art, and all savage arts begin at the foot of the ladder and end "beyond the bourne of sunset." In this apotheosis, basketry is the rival of stone working, wood carving, skin dressing, and pottery. The merely useful basket has some beauty, but the exalted specimen of handiwork is the acme of intelligent discrimination in the materials as well as of hand skill and taste, and leads up to the choicest textile productions. Its maker must be botanist, colourist, weaver, designer, and poet, all in one. But could the windows of her mind be thrown open wide, there would be seen, in addition to all these, the mystic love of her tribe alive and active. In the old days of unsophisticated savagery, no doubt, there was everywhere in America the overseeing and guiding presence of the mythic in the practical. Its relics are still to be found on fragments of pottery especially, and there is no reason to doubt that it reigned in other departments of activity. The old-time basketmakers were under its spell everywhere. It would be an interesting study, though it can not be pursued here, to find out how far the various peoples of Europe, in settling down upon the lands of the savages, had by their ethnic traits and beliefs gradually eliminated or modified those of the aborigines in the matter of symbolism.

Besides the unmodified artistic motives in the designs on basketry, there still survives in the Pacific coast area a sym-

bolism more or less connected with Indian cosmogony. The maker is a sorcerer. In such tribes as the Hopi this idealism in design is still alive and active. Among the Algonkin Indians of the Atlantic States the thought seems to have escaped entirely from the design, and the Indian woman making her baskets at the seaside resort, at the springs, or at Niagara Falls has no more idea of putting a thought into the colours and patterns which she weaves than if such a thing never existed. The designs are changed to suit the whims of the buyers. Idealism is buried in commercialism. Tracing the motive around the Arctic region, there still is found no pattern in basketry until southern Alaska is reached. In the birch-bark ware of middle Alaska and Canada, and in the rawhide-parfleche receptacles of the Sioux and other Plains tribes, the mythical conception is reawakened. The Ojibwa about the Great Lakes preserve all sorts of ancient patterns in porcupine-quill work on birch bark, while the Sioux, the Arapahos, and Kiowas paint upon their parfleche cases the totemic symbolism of their tribes.* It is well to keep in mind these other symbolic representations in speaking of basketry, since they raise questions of origins and relationships. Boas is inclined to refer the designs on Salishan basketry to the tribes inland across the Cascade Mountains.

The Haida Indians of Queen Charlotte Archipelago make wallets and hats of spruceroot, now and then weaving in a band of black, but the ware is extremely plain. Its decoration depends upon the various types of weaving employed and painted symbols. But the Tlinkits on the mainland and islands of southeastern Alaska, on the other hand, cover the surface of their baskets, made precisely similar to those of the Haidas, with symbolism connected with their daily life. It has been thought that anciently the Tlinkits made baskets like the Haida without coloured ornaments, and that the designs on

* A. L. Kroeber, The Arapaho, Bulletin of the American Museum of Natural History, XVII, 1902, pp. 1–150.

the baskets have no mythological significance. The Chilkats, however, who are akin to the Tlinkits and live on the mainland, cover the surface of their fringed robes with their totemic symbolism in most subtle fashion. The technical process on these blankets is precisely the same as that on the baskets, only the blankets are made in soft wool while the baskets are in hard material. Coming farther southward, the land of the imbricated basket is reached. The symbolism on this ware has been worked out by Livingston Farrand.* Further on, these designs will be taken up with greater detail. As the inscriptions on Assyrian slabs have preserved the thoughts and lore of Mesopotamia and the hieroglyphics of Egypt held secure for millenniums the story of the oldest of empires, so in a much humbler fashion the myths and stories of these Indians have been in the olden times symbolised on their basketry. As there is no Rosetta stone nor alphabet of design for their decipherment, all the more diligent must the present seeker be to save the evanescent records. The basket is frequently made for no other end than to record the legend.

The Salish tribes of Washington and Oregon, and tribes of California, Arizona, and New Mexico, all place some kind of designs on their basketry. Whether it has a symbolical significance or not has to be determined in each case by inquiry. Looking at the whole field as revealed in collections and publications, the following classes of objects and phenomena sought to be represented seem to be complete:

1. Natural phenomena, such as lightning, sunrise, clouds, and sky.

2. Natural features of objects, such as mountains, lakes, shores, and rivers.

3. Plant phenomena, including splints of the plant used to make the design.

4. Animals and parts of animals. There is no end to this species of design, from the attempt to represent the entire animal

* Basketry Designs of the Salish Indians, Memoirs of the American Museum of Natural History, II, 1900, Pt. 5, pp. 393–399.

alive and in motion, to the few stitches which stand for a part of the creature, perhaps a wing, a fin, an eye, or a tooth, to show what the animal might be.

5. Human beings, either full or in part.

6. Devices used by the Indians in their occupations, arrowheads especially.

7. Ideas connected with the Indian thought and life; for example, such as the opening in a Navaho basket.

8. Mythical personages connected with sorcery and witchcraft.

9. Their gods and heavenly beings.

In thinking of symbolism, the sign or form on the basket and the thing signified must be kept separate in the mind. The sign may be at the beginning pictorial, and pass down through changes and abbreviations to a mere outline that has no suggestion in it, or a simple geometric figure common in the technic may become a mythic being by making here and there a significant addition through suggestion.

When it is remembered that the Indian represents in a general way the childhood of the race, one has but to revert to that period of life to recall how a spot of ink or a meaningless form was transformed into a picture of something real or ideal. A fundamental geometric figure on basketry may in similar fashion, by the addition of a line or two, become almost any design, the visible home of any symbol.

In this work, devoted more particularly to the technical side of basketry, the manner of realising the symbol is still important. However, it is not so much sought to teach that a certain design represents a butterfly as to see how the woman put the form into the texture of her basket.

The sculptor, the painter, the carver, and the potter are more realistic than the basketmaker, since the making of portraiture and pictures is easily within their reach. Yet nothing is more common among them all than abbreviation and synecdoche. Not only are they under the spell of symbolism, but the symbol is curtailed to the lowest terms. A fin stands for a whale, incisor teeth for a beaver, the beak for a bird, and

often the image is completely obliterated in the symbol. Now, the basketmaker is still more handicapped by her technical limitations, and driven to symbolism if she did not largely invent it. For pictorial effects on the surface, the maker is hampered by the limitations of weaving and sewing. It will be found, therefore, that her temptations are to pass more quickly to the symbolic stage of representation. It is well to remember, also, that just as on the baskets themselves the symbolism, starting with pictures, has in some tribes been reduced to its lowest terms, so in the basketmaker's mouth the legends have become faded into concrete words and then into meaningless terms, yet the thought is there. Of a certain form on a basket plaque the Hopi woman would say it is the bird that carries messages to the rain god; another tribe would call it a bird; a third name it wings, and finally it becomes an empty geometric design. Again, the student himself passes through a process of initiations as the subject is exploited.

It is said that Pompey declared, when he had drawn aside the veil of the Holy of Holies, at Jerusalem, "The Jews worship nothing." With some such feeling the collector of baskets begins his quest. The first impression is that no set patterns were in the maker's mind. She had a sense of the beautiful and loves to give her fancy free rein. Indeed, the reticent and suspicious basketmaker helps the delusion. A little later the discovery is made that the patterns stand for things, but still for general notions. It is only after long familiarity and systematic converse with old basketmakers that the veteran collector learns that the belief that these patterns stand for mountains, lakes, rivers, men and women, deer or other mammals, flying birds or bird tracks, fishes, insects, flowers, plants, heavenly bodies, or articles of use and worship merely is but a fraction of the truth. They are concrete, standing not for all or any, but for one, and underneath them is charming folk-lore. Mrs. Shackelford tells of a certain intricate pattern on a Washington basket that it represents

ripples, but on patient inquiry it was found to mean the subtle movements in the under waters of a certain lake upon a special occasion. To appreciate symbolism fully, one must know the sign, hear the story, and then study the skies, the landscape, and the social environment.

It is too early to attempt to discover an alphabet in this primitive art, for each tribe adapts old and new standard forms to its own concept myths. The artist alone, in every case, can interpret them. This existence of concrete stories in art form is not confined to basketry. Dr. Boas is authority for saying that the intricate totem post and composite painting of the North Pacific coast can be interpreted only by the carver. The attempt to find a clue to the mystery of their composition is hopeless, for none exists. As soon as the perfection of monotony or uniformity has been reached in the technic to form the basis of real art, there ensues a variety no less thorough and diversified in the ornamentation for symbolising the same idea. The rule in the Indian woman's mind seems to be reduced to a formula like this: "The minimum of variety in the technic; the maximum of variety in the symbolic." Or, in other phrase, variety of symbolic expression in the unity of the real art. One looks carefully at a set of drawings like those of Emmons, Farrand, Fewkes, or Dixon, and turns to a familiar collection to find the same symbols. They are not there; or, rather, they are hiding there. It is a question whether there be two baskets alike in design among any tribe. This is the real charm of savage handwork as compared with the rather dull uniformity of machine products. All the tribes of the West that have preserved their symbolisms have at the same time made the most of their liberty to modify the original.

The subject of symbolism may be studied from several points of view, the technic, the elaborative or historic, and the ethic. Beginning with the technic as the easiest, symbolism is wrought in checker, twill, wicker, twine, and coil.

Looking at a coarse piece of matting made up of monotonous squares, it is not easy to see how the story of creation or tribal preservation could be wrought into them. But with finer elements and the introduction of colour, a part of the difficulty vanishes. In point of fact, however, there is little evidence that sentiment was wrought into checker, or even into twilled weaving. There is no essential difficulty in the way. Mosaic in stone or other hard material is made up of little blocks, chiefly squares, and both the twined and the coiled basketry surfaces contain innumerable designs made up in small squares in black or other colour.

Symbolism may be studied in its elaboration or historic development. The history of a symbol on basketry is the same as that of a design on pottery or a painting on hide. Perhaps, since the technical demands are more exacting, the progressive appearance of the ideal is more rapid and the hiding of the original more complete. A moment's thought makes it clear that one is dealing simply with a universal law of mental development. The basketry of any one tribe will show what is meant. On a single Hopi plaque it is not rare to see side by side the complete figure of a bird or butterfly with outspread wings and near by an abbreviated cross which means the same thing. (See Plate 47.)

Another specimen constructed by the same hands will have the cross but not the birds. By and by enough examples are brought into comparison to show the process of fading out through which the realistic becomes only a skeleton. There is a celebrated Japanese painting showing seven stages in the life of a beautiful girl. As she passes into womanhood, through all its years, behind the real face the pretty child is seen, and even the skull that lies among the flowers shows to the beholder, after a moment's gaze, the lovely girlish face. In the last relic of symbol on basketry, to the trained eye of mythology the same transition takes place. The comparison of an ordinary lot of California basketry, their zigzag lines, arrow-

heads, mountains, and crossing paths, with such treasures as are in the Merriam collection, each gathered from the hand of the maker, together with the song of the soul whose melody is written there also, makes plain what is here set forth.

Professor Farrand calls attention wisely to the fact that in the reduction of symbols to their lowest terms very dissimilar forms have converged until the same figure does duty for many objects, the technical exigency or strain predominating. This has led to differences of opinion among native connoisseurs, and frequently confusion to the ethnologist. The same observation would be true in working the other way. It is only in most recent times that psychologists have appreciated the power of suggestion in helping one to determined action.

Recently a package of beautifully marked shells was sent to the National Museum as the probable origin of designs in savage art. Nothing could be farther from the truth Form does not come to the savage artist's mind in that way. Whether the symbol arise by contraction or expansion, the artist is the creator of new forms, working always within the school of her materials and tools.

Wicker basketry in its worst state is positively ugly. In the eastern part of North America no attempt is made to put a legend upon it, but in New Mexico and Arizona it is found in two forms side by side, one as plain as undressed stems can be made, and the other at the topmost point of pictorial representation. In Oraibi, the most western of the Hopi (Moki) towns, are made the pretty little wicker plaques called Katchinas. The finding of fragments of these in ancient ruins by Dr. Fewkes is good proof that they have long been made by the Hopi. Farther on, the designs themselves will be examined. They are mentioned here rather to show that where there is a will with the human species, of whatever colour, there is a way. Examples of Katchinas are shown in Plates

85 and 93. The Hopi wicker plaques are made up of short stems of *Chrysothamnus* that have been previously smoothed and dyed in as many colours as are needed. The work resembles closely that in porcupine quills. Figures do not show effectively on the back, for the reason that a single stem often passes over only one warp element. Symbols of complex pattern are also frequently finished out with the brush. In many of the intricate symbols on the Katchinas the narrow limitations of the material and the curve of texture that can go in one direction only put the artist to her wits' end for conventionalisms. She does not mind, but goes ahead. True, a rainbow must be upside down; the sky goddess must have rectangular eyes and mouth. There is no perspective, the round must be flat, and even those features that are out of sight must be brought to view. Never mind; the ideal wins and the plaque is finished.

With twined work the case is different. All its varieties are capable in themselves of expressing ideas even in one colour, but as soon as overlaying, embroidery, and the use of different hues are added there is practically no end to the possibilities. In this connection the reader may be reminded again that designs must not be confounded with symbols. The former are apparent and constant and extremely limited; the latter ideal and as varied as an Indian woman's fancy. But in the chapter on ornamentation it was seen how varied in different hands and materials twined patterns might be made. Twined ware is, if anything, at the start the coarsest of all, for what could be ruder than the wattling of a fish weir or the wall of a granary? Taking the geographic areas in turn, it is not until southeastern Alaska is reached that an attempt to tell a story in twined decoration occurs. Even there, the symbol exists more in the false embroidery on the surface than in the twined work. In point of fact, however, whether studied with Emmons for southeastern Alaska, with Farrand on Salish ware, or with Dixon in northern California

tribes, it is not in twined work that the most exalted and idealised symbolism has been wrought.

Coiled ware also has such a variety of technical treatment, with the whole colour scheme of nature to select from, that in practice there is no limit to the form and combination of designs or of symbolism. In these the weaver secretes her thoughts. You must ask her what they mean. Rarely is one of her symbols widespread. In the next tribe the sign will stand for quite something else. It is well to observe here that a vast deal of coiled basketry has no symbol or design on it whatever.

Ethnic symbolism.—Recurring to the six ethnic areas which, for convenience, have been adopted in this publication, basketry has lost all trace of symbolism among the Indians of eastern North America. It cannot be for a moment supposed that they have none, for with Algonquian, Siouan, Kiowan, the substitutes for basketry, rawhide receptacles, as well as moccasins, cradles, and objects in three dimensions, are covered with idealism in painting and embroidery.

To understand the richness of this survival of aboriginal symbolism, the student will receive his principal aid at hand in the researches of A. L. Kroeber among the Arapaho.* Four hundred and fifty-eight distinct symbols are given in figures covering Indian ideas from common objects to spiritual beings. All the closing pages of the above-named paper (pp. 138–150) must be examined carefully in order to comprehend both the sign and the thing signified, the thought and the overthought, the text and the symbolic context in Arapaho embroideries, paintings, and three-dimension designs. The closing paragraph will give the gist of Dr. Kroeber's study:

* Symbolism of the Arapaho Indians, Bulletin of the American Museum of Natural History, XIII, 1900, pp. 69–86; Decorative Symbolism of the Arapaho, American Anthropologist N. S., III, 1901, pp. 308–336; The Arapaho, Bulletin of the American Museum of Natural History, XVIII, 1902, pp. 1–150.

The closeness of connection between this Arapaho decorative symbolism and the religious life of the Indians can not well be overestimated by a white man. Apart from the existence of a great amount of decorative symbolism on ceremonial objects not described in this chapter, it should be borne in mind that the making of what have been called tribal ornaments is regularly accompanied by religious ceremonies; that some styles of patterns found on tent ornaments and parfleches are very old and sacred, because originating from mythic beings; that a considerable number of objects are decorated according to dreams and visions; and, finally, that all symbolism, even when decorative and unconnected with any ceremony, tends to be to the Indian a matter of a serious and religious nature.

Mrs. Sidney Bradford, of Avery Island, Louisiana, discovers the following symbols on the twilled basketry of the Chetimachas, an almost extinct tribe in her State. (See Plate 133.)

1. Nesh-tu-wa-ki: Alligator intestine, a sinuous line.
2. Cous-pi-se-on: Muscadine rind. A row of squaws.
3. Chish-nish: Worm track, fretted sinuous line.
4. Can-ops-to-man: Things over again, fretted line.
5. Marx-narx: Perch fish. A row of open diamonds.
6. Cars-ox-oxun: Something around, little squares in other squares.
7. Wash-ti-ka-ni: Beef eye. A row of wheels.
8. Arx-tan-tini: A big mark. A row of black dentales marks.
9. Ops-tong-kani: Crosses. Rows of little X marks between.
10. Another worm track: Row of ellipses or rhombs.
11. Kark-mark-ta: Bottom of basket, four triangles forming square.
12. Kop-kop-ni: To catch something. A row of diamonds.
13. Another worm track: Chevroned bans.
14. Acon-wa-ash: Beam earring. Row of arrowhead forms.
15. Nak-ka-ki-li: Turtle neck. Row of loops or festoons.
16. Chek-ka-ni: Black hind-eye. Drum-shaped pattern.
17. Tchu-tchu: Big crop basket. Surface covered with checker pattern.

The Eskimo, also, and the Aleuts perpetuate no thought or myth in basketry symbols. The etchings of the former on

ivory are also modern, and were learned from outside teachers. It is not in these that the idea is to be sought. Not for a moment is it to be thought, however, that there is no symbolism existing. All the life is wrapped up in hunting. The long, dark winter, the return of the sun with the innumerable retinue of life in the air and in the waters, gives the key-note. It is in the drama of hunting and the masks worn in dances that symbolism is embodied.

On the Pacific coast from Alaska to the peninsula of California and in the Interior Basin the tribes have been left to their own devices through the centuries, and it is here that survivals of symbolism are to be sought. They will be found in one place full of life and ancient spirituality; in another, stung by civilisation, they are as torpid as the spiders that are placed in their nests by the mud wasps.

The name Tlinkit applies to a number of basket-making tribes in southeastern Alaska. In their charming archipelago they have developed a unique scheme of symbolism growing out of their mode of life. This has been thoroughly studied by Lieutenant G. T. Emmons, United States Navy, in his collections in the American Museum of Natural History, New York, and the identifications here made are on his authority.* They cover a wide range of meanings. Supplementary to this basket symbolism—or, rather, preëminent over it—are the Chilkat blankets and the endless variety of carvings in stone, horn, and wood, and the symbolic paintings on all sorts of surfaces. The following identifications are from specimens in the United States National Museum:

Ars suckhar ha yar ku: Spirit voice, or shadow of a tree.
Kah thluckt yar: Water drops.
Kisht: The crossing.
Klake da kheet see tee: Single tying around.
Klaok shar yar kee kee: Head of the salmon berry cut in half.

* Basketry of the Tlingit Indians, Memoirs of the American Museum of Natural History, III, 1903, pp. 229–277.

Ku Klate ar ku wu: The Arctic tern's tail.
Kuk thla ku: Flaking of the flesh of fish.
Shon tche kulth kah katch ul tee: Tattooing on the back of the hand of an old person.
Shuh tuck ou hu: Shark's tooth.
Shar dar yar ar kee: Work on Shaman's hat.
Thlul k yar nee: The leaves of the fireweed.
Ut tu wark ee: An eye.
Ut kheet see tee: Tying around.
Yehlh ku wu: Raven's tail.

Plate 71 shows specimens of twined wallets made of spruce roots, for carrying berries and other articles of food on the back. The left-hand figure in this plate is Catalogue No. 20,704 in the National Museum, and was collected by James G. Swan, at Sitka, Alaska. It is an excellent specimen of twined weaving, with what is here called false embroidery. The figures on the surface, determined by Lieutenant Emmons, are as follows: The two wide bands contain the following ornaments: The large five-sided figures in the middle are the "Shark's tooth"; the chevron pattern covering the shark's tooth means the "Flaking of flesh of fish into narrow strips"; the small triangular figures are the "Salmon berry cut in halves," but in this arrangement also called "Water drops"; the narrow middle band is rendered "Single tying around"; below the ornamental bands the cross-shaped figure represents the "Raven's tail."

The right hand figure in this plate is also a berry basket. The two wider bands have the same design, having a bar in the middle with its ends bifurcated, known by the Tlinkit as "The crossing." The triangles in these bands stand for "The salmon berry cut in halves." The middle band is "Tying around." The vertical designs at the bottom represent "An eye" on one side, and on the other side "Shark's tooth." The five-sided figure with a reëntrant angle stands for "The Arctic tern's tail." Cat. No. 21,560, U.S.N.M., collected by J. B. White.

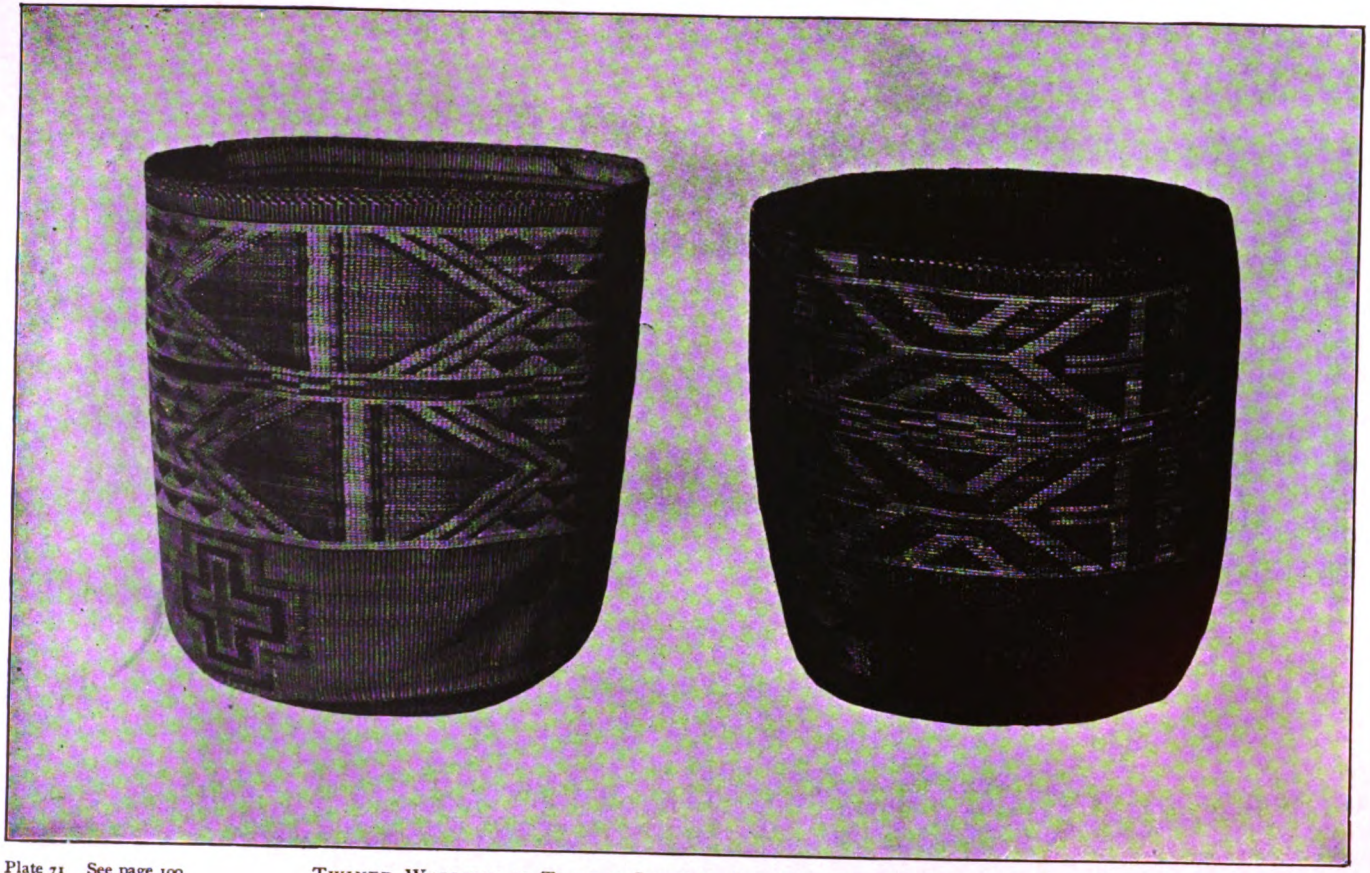


Plate 71 See page 190

TWINED WALLETS OF TLINKIT INDIANS, SOUTHEASTERN ALASKA, WITH SYMBOLISM IN FALSE EMBROIDERY

Collections of U. S. National Museum

The right-hand figure in Plate 72, Cat. No. 20,704A, in the National Museum, collected by J. G. Swan, is a cylindrical basket in twined weaving. The upper part of the body of this basket is divided into three bands worked in straw, natural colour, and dyed red and brown. The symbols in the upper and lower band are (1) the "Spirit voice, or the shadow of a tree," in zigzag lines; (2) vertical rows of rhombs, which indicate the eye; the middle band, made up of sinuous lines on rectangular figures is called "Tying around." The allusion may be either to the fact that this figure constitutes an encircling band, or to the sinuous pattern itself. On the lower part of the body the fretted pattern, with three rectangles inclosed in the bents like the bars on an epaulette, stands for "The tattooing on the back of the hand of an old person."

Plate 37 represents two small, beautiful baskets with rattles in the tops made by the Tlinkit Indians of southeastern Alaska. Both of them are covered over the entire surface with false embroidery in three colours. The small patterns on the baskets portray the salmon berry and the triangular figures stand for shark's teeth. These are fine old specimens collected in 1875 by Dr. J. B. White, United States Army. Cat. No. 21,562.

Plate 73. The bottom figure is a covered basket of the Tlinkit Indians, Cat. No. 168,282, collected by Lieutenant Emmons. The warp is crossed, and the weaving is in twined work ornamented with false embroidery. The upper band and the one across the middle of the body represent "The salmon berry cut in half," while the band on the shoulder and the one at the bottom stand for "The leaves of the fireweed."

The upper covered jar on the same plate illustrates the combination of false embroidery and the use of two colours in the material out of which the specimen is woven. This specimen is Cat. No. 9,112, U.S.N.M., and was collected in Alaska by Lieutenant F. M. Ring, United States Army.

The Haida Indians on Queen Charlotte Islands are near

to the Tlinkit in arts, but weave no symbols into their basketry. They paint various designs on their ceremonial hats, and have no end of richest symbolism on their canoes and carved in wood and slate. They also now engrave on silver and keep alive the poetry of their ancient art.

The following story, collected for Lieutenant Emmons by a friend, proves that the basket is not altogether out of touch with their world of myth:

Once upon a time there were two Haida Indian orphan girls living on Queen Charlotte Islands, British Columbia. After being punished by their stepmother for eating up a store of deer tallow, they resolved to run away. They wandered about in the forest a long time, and were eventually rescued by the "seek quan ni" (Black Bear tribe), one of whom married the girls. Years afterward, these girls determined to visit the scenes of their sad childhood. For their journey back from the forest to places of human habitations their good totem spirit directed them to weave two baskets apiece large enough to fit over the end of the thumb. These they were directed to fill with crumbs of various kinds of cured meats and deer tallow. As in the miracle of the five loaves and two fishes which sufficed for a multitude, the contents of these tiny baskets furnished food for the two women on their journey of many moons. Arrived at the entrance of their father's house, their baskets suddenly became very large—so large, in fact, that it required the strength of many slaves to take them into the house. The women found their stepmother still alive. They offered her the various meats and tallow which they had brought from their forest home. More and yet more food they pressed upon her, until the unhappy woman died of overeating.

Professor Farrand selected, happily, the most versatile of all the North American families of Indians for his studies, the Salishan. Among these, the Lillooet and Thompson baskets, of British Columbia, supply the flat and round types of im-

bricated coiled work, and the Quinaielt, on Puget Sound, the overlaid twined weaving. The Klikitat ware is not included, but a comparison of its symbols with the Salish would be profitable. The line of development in symbolism among the Salish tribes has been from the pictorial to the geometric. Professor Farrand finds that the use of animal designs is by no means predominant. This was seen to be true on the Tlinkits also, while the Chilkat blanket shows the dissected and distorted motives described by Boas.*

The list of symbols on the baskets of the lower Thompson Indians is given by Mr. James Teit. It is made up of:

1. Arrowhead pattern (tataza, arrowhead).
2. Root pattern (múla, a variety of root).
3. Butterfly pattern (nkíkaxeni, butterfly).
4. Star pattern (nkokucên, star).
5. Packing-strap pattern (tsupîn, packing-strap).
6. Zigzag pattern (skolotz, crooked).
7. Box pattern (luka, grave box).
8. Eagle pattern (haláu, eagle).

Each of these words is compounded with the suffix "aist," pattern; but the lower Thompson also have symbols for snake or snakeskin, snake or snake tracks, rattlesnake tail, grouse or bird tracks, bear foot or bear tracks, bird or geese flying, fly, beaver, deer, horse, man, hand, tooth, leaf, shells (dentalia), stone hammer, comb, necklace, net, root-digger handle, leggings, canoe, trail, stream, lake, mount, air, lightning, and the same is true of other Salishan tribes.

Plates 74 to 79 reproduce Professor Farrand's figures, and the descriptions are from his monograph.† These illustrations, being most of them in a difficult technical process, called imbrication, furnish excellent studies in mosaic pictographs.

* The Decorative Art of the Indians of the North Pacific Coast, Bulletin of the American Museum of Natural History, IX, 1897, pp. 123–176.

† Basketry Designs of the Salish Indians, Memoirs of the American Museum of Natural History, II, 1900, pp. 393–399.

The elements are all little squares in different colours, varying from one-eighth to one-quarter inch in dimensions. Much charity is needed in detecting the thing in the symbol. The shark's mouth, with its horrid teeth, is rather intensified by the angularity of the design, but most of the things represented are hidden in the symbol.

Plate 74, fig. 1, shows a coiled and imbricated berry basket of the Lillooet Indians, British Columbia. It has a pyramidal form, flat foundation in the coils, and the decoration is in two segments or bands. The designs are flies, arrow-heads, and half circles (?). The lower stripes are clusters of flies. Height, 10½ inches; 1 inch=7½ stitches, 4½ coils. Compare Cat. No. 213,535, U.S.N.M.

Plate 74, fig. 2, shows a twined and overlaid basket of the Quinaielt Indians, Washington. Its design represents flounders. Height, 5½ inches; 1 inch=8 twists, 12 rows of weaving.

Plate 74, fig. 3, shows a coiled and imbricated basket of the Lillooet Indians, British Columbia, with structural elements the same as in fig. 1. Its design is a head, with mouth, teeth, and hair along the back of the head. The stripes below are arrow-heads. Height, 11 inches; 1 inch=7½ stitches, 4 coils.

Plate 74, fig. 4, represents the end of Plate 75, fig. 6, Lillooet. The design is said to typify flies. Compare example 216,422, U.S.N.M.

Plate 74, fig. 5, shows a coiled and imbricated basket of the Lillooet Indians, British Columbia. The two segments are preserved in the design as in figs. 1 and 3. The structural features are also the same. The design is a head, with open mouth; below are arrow-heads. Compare fig. 3.

Plate 74, fig. 6, represents a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. Special attention is called to the ridged surface caused by a bundle of splints. On this plate are shown the two radically different methods of laying the foundation for the coil. The two

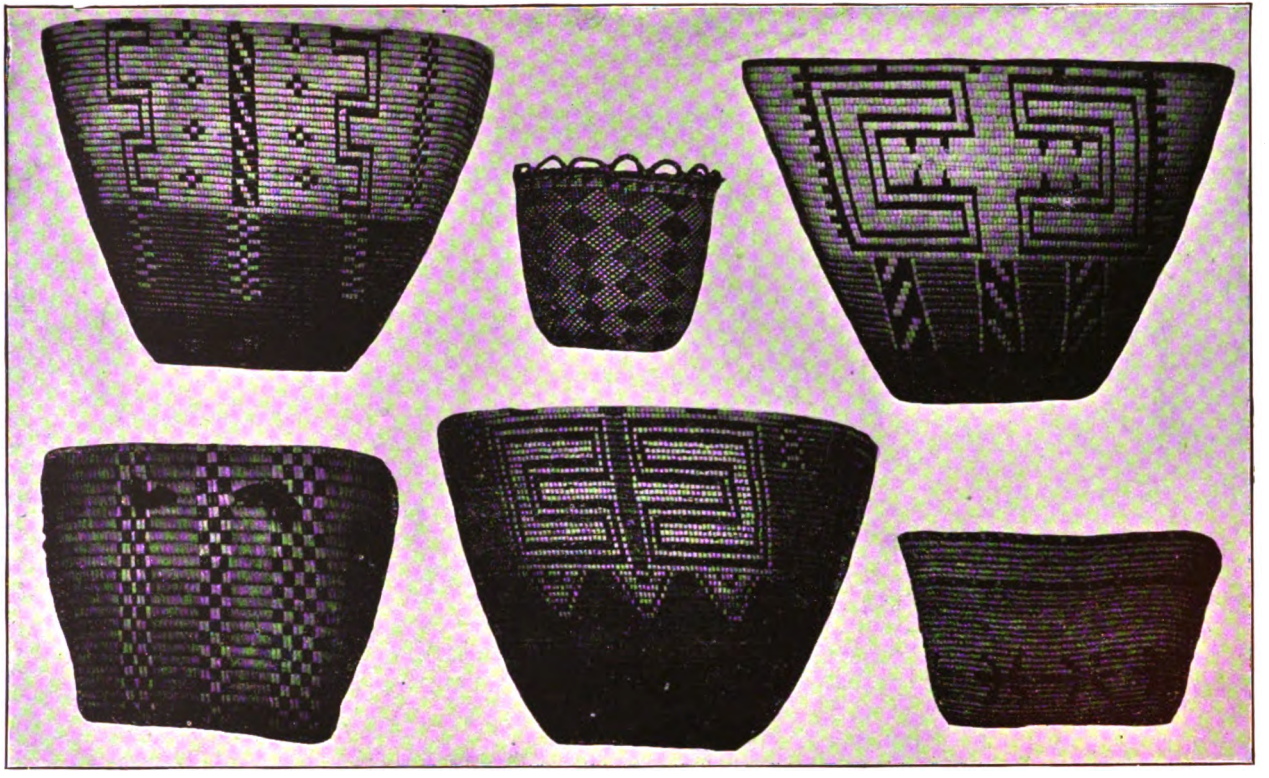


Plate 74. See page 194 SYMBOLISM ON SALISH BASKETRY, BRITISH COLUMBIA, AFTER LIVINGSTON FARRAND

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narrow black and white stripes on the upper portion are made by beading, and represent earth lines. The lower figures are grouse tracks. Height, 6 inches; 1 inch=6½ stitches, 5 coils.

Plate 75, fig. 1, represents a coiled and imbricated cooking-basket of the Lower Thompson Indians, British Columbia, with a design of flying geese. The foundation of the coil is of splints; the distinctive characteristic is that the ornamentation covers the whole surface and is not divided into bands. Height, 9 inches; 1 inch=6½ stitches, 4½ coils.

Plate 75, fig. 2, shows a coiled and imbricated covered basket or trunk of the Lower Thompson Indians, British Columbia, while the design is of a rattlesnake's rattle. Height, 5 inches; 1 inch=6 stitches, 3½ coils.

Plate 75, fig. 3, represents a wrapped-twined bag of the Yakima (Shahaptian family) Indians, Washington. The National Museum has many bags from Shahaptian tribes showing Farrand's symbols. The design is of flying birds. Height, 22 inches; 1 inch=7 stitches, 9 rows.

Plate 75, fig. 4, shows a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. Its design is a snake trail or track. Height, 9½ inches; 1 inch=6½ stitches, 3½ coils.

Plate 75, fig. 5, shows a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. The design indicates a snake trail. In technical elements this example is Thompson, but the crenelated form of design is widespread and has many interpretations. Compare Plate 74, fig. 1; also Merriam's butterfly design, page 332. Height, 13 inches; 1 inch=6½ stitches, 3½ coils.

Plate 75, fig. 6, represents a coiled and imbricated basket of the Lillooet Indians, British Columbia. The shape and flat foundation are Lillooet, but the solid design over the whole surface is not so. The design shows flies, snake tracks, and arrow-heads (side view). Height, 10¼ inches; 1 inch=5½ stitches, 2 coils.

Plate 75, fig. 7, is a coiled and imbricated globular basket of the Lower Thompson Indians, British Columbia. The design represents a snake coiled around the basket, and exists on baskets in other Salishan tribes. The vertical line interrupting the coils shows the limitation of this style of weaving, made up of a continuous spiral, and not of a series of rings. Height, 7½ inches; 1 inch=8 stitches, 4½ coils.

Plate 75, fig. 8, is a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. This beautiful example is true to type in all except the angular design. The designs represent butterflies' wings. Height, 14 inches; 1 inch=6 stitches, 3½ coils.

Plate 76, fig. 1, is a coiled and imbricated basket of the Lillooet Indians, British Columbia, the upper design representing intestines; the vertical stripes in the lower segment are flies. Height, 11 inches; 1 inch=7 stitches, 4 coils.

Plate 76, fig. 2, is a coiled and imbricated basket of the Lillooet Indians, British Columbia, with a design representing a net; the interspaces show deer shot by arrow, deer, man, dogs, flies. The flat coil in the bottom, the absence of angles, the design over the surface are noteworthy in the basketry of the Lillooet Indians. Height, 13½ inches; 1 inch=6 stitches, 3½ coils.

Plate 76, fig. 3, is a coiled and imbricated basket of the Lillooet Indians, British Columbia, with a design representing a man with feather in his hair, bow and two arrows, and at either end a notched ladder (?). The lower segment is beaded. Height, 8¾ inches; 1 inch=8 stitches, 5½ coils.

Plate 76, fig. 4, shows a typical coiled and imbricated basket of the Lower Thompson Indians, British Columbia. The design is a plant with fern-like leaf, end view. Height, 8½ inches; 1 inch=7½ stitches, 3½ coils.

Plate 76, fig. 5, shows a coiled and imbricated basket of the Lillooet Indians, British Columbia, having a design representing arrow-heads and flies. In technic this example

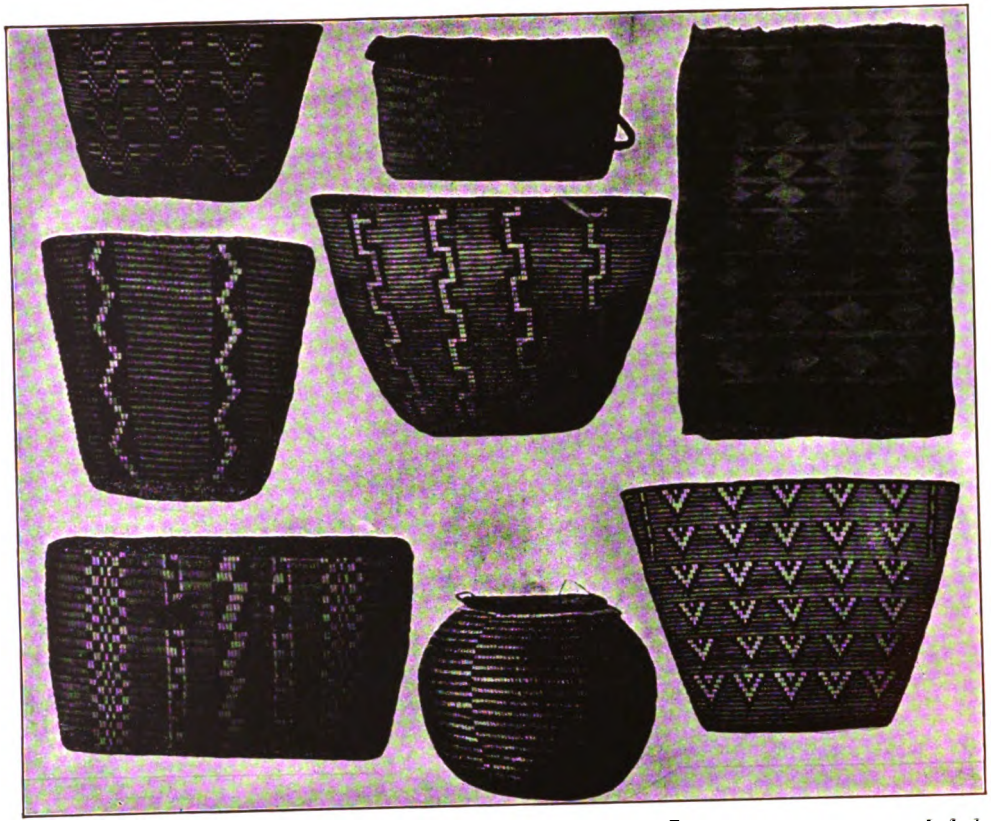

Plate 75. See page 195 SYMBOLISM ON SALISH BASKETRY, BRITISH COLUMBIA, AFTER LIVINGSTON FARRAND

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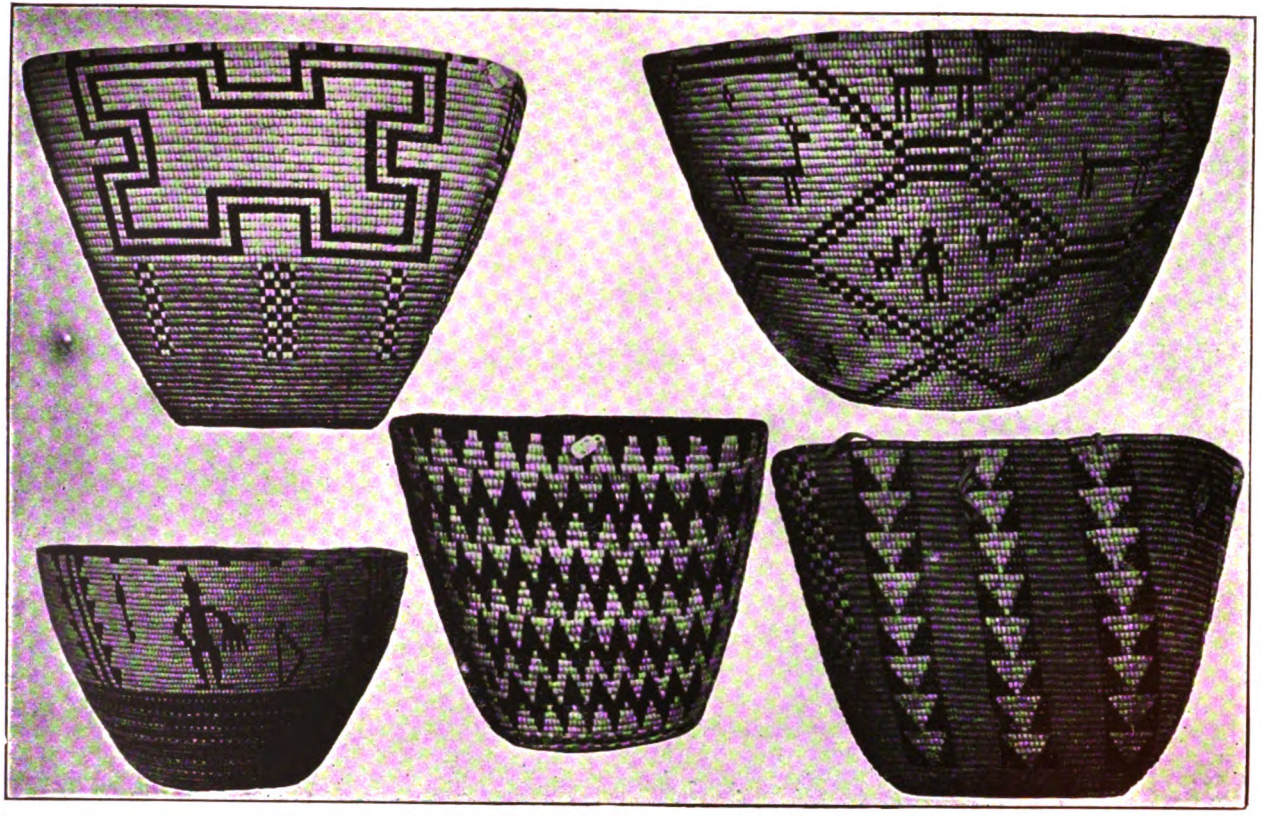

Plate 76. See page 196

SYMBOLISM ON SALISH BASKETRY, BRITISH COLUMBIA, AFTER LIVINGSTON FARRAND

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represents the older forms. Height, 11 inches; 1 inch=7 stitches, 4 coils.

Plate 77, fig. 1, shows a coiled and imbricated basket trunk of the Lillooet Indians, British Columbia. The structure and form are decidedly Hudson's Bay Company in motive. The design represents arrow-heads of different shapes. Height, 9 inches; 1 inch=5½ stitches, 3½ coils.

Plate 77, fig. 2, shows a bag in twined weaving, with wrapped ornament, of the Wasco Indians (Chinookan family), Washington, with designs representing flying birds, men, and sturgeon. Height, 8½ inches; 1 inch=8 twists, 12 rows.

Plate 77, fig. 3, is a coiled and imbricated basket trunk of the Lower Thompson Indians, British Columbia; design, arrow-heads. This specimen shows the intrusion of Hudson's Bay Company forms into the upper country. Height, 6½ inches; 1 inch=7 stitches, 4 coils.

Plate 77, fig. 4, represents a coiled and imbricated basket of the Lower Thompson Indians, British Columbia, with a design showing a packing-strap or tump line, possibly a net. This is a good type in technic, form, and decorations. (See also figs. 6, 7, and 8.) Height, 11½ inches; 1 inch=6½ stitches, 4 coils.

Plate 77, fig. 5, is a coiled and imbricated packing-basket of the Lower Thompson Indians, British Columbia, with a design representing grave or burial boxes. This is an interesting hybrid, with Thompson stitch and decoration on a Coast box, having even the added foot. Height, 6¾ inches; 1 inch=7 stitches, 4½ coils.

Plate 77, fig. 6, is a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. The design indicates crossing trails, possibly stars. Height, 14 inches; 1 inch=6½ stitches, 4 coils.

Plate 77, fig. 7, is a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. Legend, stone hammer, side view. Compare example 217,438, U.S.N.M.

Plate 77, fig. 8, is a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. Height, 9 inches; 1 inch=7½ stitches, 3½ coils.

Plate 77, fig. 9, shows a twined and overlaid basket of the Quinaielt Indians, Washington, with a design representing a fish net. Height, 7½ inches; 1 inch=5 twists, 8 rows of weaving.

Plate 78, fig. 1, shows a twined and wrapped wallet of the Upper Thompson Indians, British Columbia, with a design representing lakes, lakes connected by streams, ducks flying toward the lakes, and animal footprints. Figs. 1–4 are akin to the Shahaptian work in Washington, with the exception that the decorative filaments are wrapped about both elements of the twine. Height, 21 inches; 1 inch=9 twists, 13 rows of weaving.

Plate 78, fig. 2, is a reverse of the preceding, having a design of arrow-heads and crossing trails.

Plate 78, fig. 3, is a twined and wrapped wallet of the Upper Thompson Indians, with a design showing three rows of lodges. Height, 23 inches; 1 inch=5½ twists, 8 rows of weaving.

Plate 78, fig. 4, is the reverse of No. 3, and has a design showing household utensils.

Plate 78, fig. 5, is a twined and overlaid wallet of the Quinaielt Indians, Washington, having a design representing a mountain chain. Height, 8 inches; 1 inch=6 twists, 8 rows of weaving.

Plate 78, fig. 6, shows a twined and overlaid basket of the Quinaielt Indians, Washington. Its design is called a mountain chain. Height, 10 inches; 1 inch=5 twists, 7½ rows of weaving.

Plate 79, fig. 1, is a coiled and imbricated basket of the Lower Thompson Indians, British Columbia. The design is said to represent mountains, with lakes in the valleys. Height, 14½ inches; 1 inch=6½ stitches, 3½ coils.

Plate 79, fig. 2, is a twined and overlaid basket of the

Plate 77. See page 197 SYMBOLISM ON SALISH BASKETRY, BRITISH COLUMBIA, AFTER LIVINGSTON FARRAND

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Quinaielt Indians, Washington, with a design representing waves or ripples on the water. Height, 10 inches; 1 inch = 5½ twists, 9 rows.

Plate 79, fig. 3, shows a twined and overlaid basket of the Quinaielt Indians, Washington, with an unknown design. It is widespread, however, and resembles a cluster of marsh plants. Resembles motives in northern California. Height, 6¼ inches; 1 inch = 7 twists, 10 rows.

Plate 79, Fig. 4, is a coiled and imbricated basket of the Lillooet Indians, Washington, with a design representing lightning. Compare Plate 75, figs. 1 and 2, where it stands for flying geese. Height, 5 inches; 1 inch = 8 stitches, 3½ coils.

Plate 79, fig. 5, is a coiled and imbricated ware of the Lillooet Indians, British Columbia. The design is said to be of meaning unknown revealed in a dream. Height, 10 inches; 1 inch = 5 stitches, 3½ coils.

Plate 79, fig. 6, is a coiled and imbricated basket of the Chilcotin Indians, British Columbia, with an unexplained design. This rare piece is noteworthy for having three or four bands of segments of independent designs. It shows in its technic little influence of foreign culture. Height, 8½ inches; 1 inch = 6½ stitches, 7 coils.

For the northern California and southern Oregon tribes the guide to the study of symbolism is Roland B. Dixon,* who divides basketry into three types (see fig. 163):

I. *Northwestern type* includes the area occupied by the Hupa (Athapascan), Karok (Quoratean), Yurok (Weitspekan). The technic is twined work overlaid.

II. *Northeastern type* comprises Modoc and Klamath (Lutuamian), Shasta (Sastean), Pit River (Palaihnihan), Yana (Yanan), Wintun (Copehan), and Maidu (Pujunan). The technic is twined and coiled.

* Basketry Designs of the Indians of Northern California, Bulletin of the American Museum of Natural History, XVII, 1902, pp. 1-32.

III. *Pomo type.*—This versatile people of the Kulanapan family in its technic is cosmopolitan, using both twined and coiled ware in every variety. The Yukian and the Costanoan tribes are left unclassed.

Three groups of symbols are distinguished by Dixon—animal designs, plant designs, and representations of natural or artificial objects. For the Pomo symbols he relies upon Carl Purdy, collector of material from that people in the American Museum, New York. For the northeastern group, Doctor Dixon has made exhaustive personal observations and illustrated the symbols in Plates I-XVI of his monograph.

The following story applies to a beautiful piece of basketwork from the Yuki Indians, now in Round Valley Agency, Covelo, California. They are associated with the Wailakis, who are Copehan, but the Yuki themselves form a separate family. Cat. No. 131,108, in the U.S.N.M., Plate 80, is called a sun basket, of Yuki manufacture, collected by N. J. Purcell, and in order to complete its history it is necessary to know what the Yukis believe to be the origin of the world. "In the beginning there was no land; all was water. Darkness prevailed everywhere. Over this chaos of dark waters hovered 'On-coye-to,' who appeared in the form of a beautiful white feather, hence the love of the Yukis for feathers. In time the spirit became weary of his incessant flight through the murky space and lighted down upon the face of the water. Where he came in contact with the water there was a whirlpool that spun his body round and round. So rapid became the motion that a heavy foam gathered about him. This became more dense and expanded in width and length. It gathered up the passing bubbles until it was a huge floating island. On the bosom of this rested the snowy form of On-coye-to. As he lay upon this island after an almost endless flight through the dark space, the idea of a permanent resting-place came into his mind. So he made the land and divided it from the water. From the form of a feather he

assumed that of a man and rested upon the land. Still there was no light, and the spirit was troubled. On-coye-to saw far off in the firmament a star, po-ko-lil-ey, and resolved to visit it and learn how it emitted its sparkling light. After a long journey he arrived and found a large and beautifully lighted world, inhabited by a numerous, hospitable people. Still, he saw not whence came the light. He was allowed free access to all the habitations save one, 'the sweat house.' This was guarded night and day, and was accessible only to sick persons. Finally a great hunt was planned, and as the time drew near all was prepared for the occasion. But On-coye-to feigned sickness, that he might investigate the sweat house. When the morning arrived for the hunt he was too ill to accompany the hunters. A council was held to determine whether this stranger should be admitted to the sweat house, which is even now a sacred place with the Yuki tribe, and it was decided to give him the benefit of this house of medicine, religion, gambling, and many other practices. A few old men were left to administer to his wants and to see that all went well. As he entered the sweat house he was almost blinded by the light that flashed upon him. As he became accustomed to it, he looked around him and discovered its origin. Hanging high over his head, in several baskets, were as many beautiful suns. Having found the fountain of light, he waited patiently until the old men were all asleep, then climbed cautiously to what seemed the brightest of the suns, took down the basket which held it, slipped from the sweat house, and made his way rapidly back toward his own world. He was hotly pursued by the indignant warriors, but he arrived safely after many adventures. He hung the sun in its basket far in the east, then surveyed it. It did not light up to suit him, and he moved it a little higher. Still it did not suit him, so he continued to move it on and on, and is moving it to the present day." Thus the Indian accounts for the moving of the sun, and thinks not that the earth moves.

The basket here shown is believed to be a copy of the same in which the sun was stolen from the other world and brought to this. On the bottom is a piece of polished abalone shell, cut round to represent the sun. Below this is suspended a new moon, then a fish, and all around the sides hang pieces of the same shell, which the Yuki say represent the stars. (N. J. Purcell.)

As before mentioned, Doctor Dixon relies on Mr. Purdy for the symbolism on the Pomo basketry. The collection was made in 1900, and the names of designs given. Since that time more information has come to Mr. Purdy, and some of the terms are changed. The United States National Museum has the collection of Doctor J. W. Hudson for comparison, made some years earlier. The interpretations of the symbols by the two men are quite as interesting a study in the psychology of the collectors as of the Indian basket women. From Doctor Hudson's manuscript, accompanying his collection, the following notes on symbolism are taken. The underlying thought in his mind is that each separate social group of the Pomo has peculiar types of basketry known by the key-note in the ornamentation, which is the totem of that group.

Both in painting and in feather decoration, the following colours have a significance with the Pomo:

Red: bravery; pride. (Personified by the woodpecker.)
Yellow: amatory; success; gaiety; fidelity. (Lark.)
Blue: demoniac cunning; perfidy. (Jay.)
Green: astuteness; discretion; watchfulness. (Duck.)
Black: conjugal love; beauty. (Quail.)
White: riches; generosity. (Wampum.)

The following interpretations of signs were given by Dr. Hudson in connection with his collection of basketry secured by the United States National Museum:

Baiyakan (Baiyak, net mesh). Same as Mr. Purdy's. The design is an alternation of dark and light squares between two boundary lines.

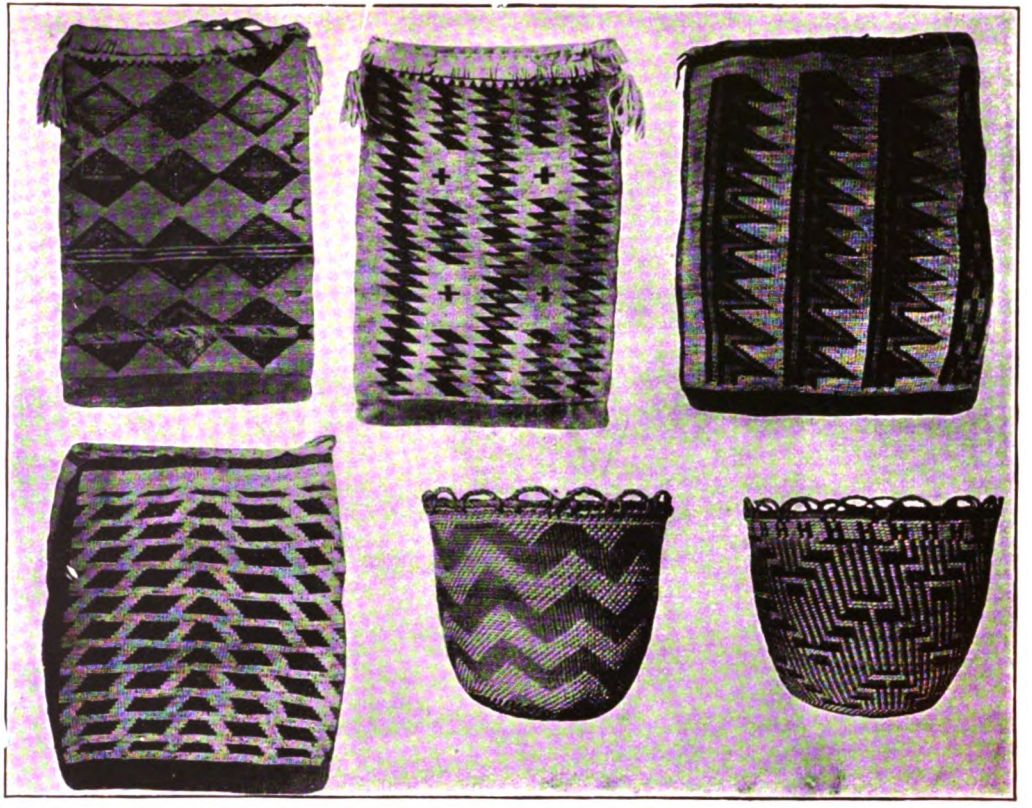

Plate 78. See page 198 SYMBOLISM ON SALISH BASKETRY, BRITISH COLUMBIA, AFTER LIVINGSTON FARRAND

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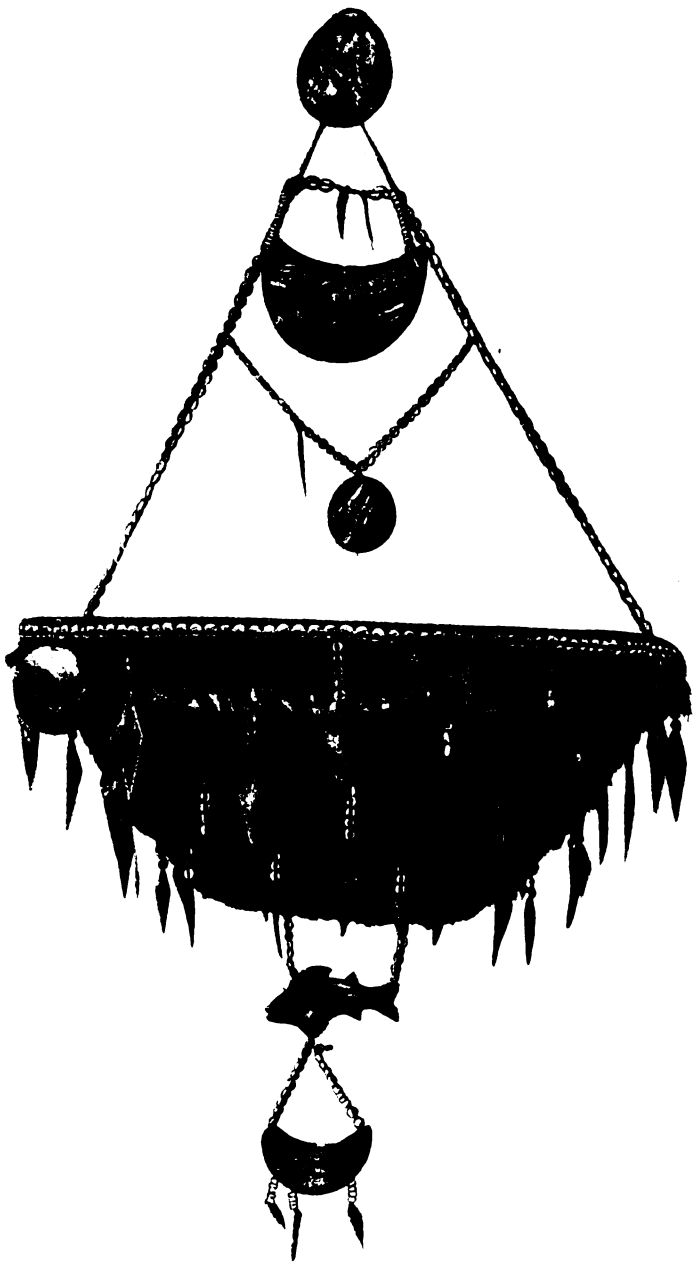
Collections of Am. Mus. of Nat. History, N. Y.

Plate 80. See page 200

YUKI FEATHERED AND JEWELLED BASKET

In which Oncoyeto stole the sun and brought it to his people

Collected by N. J. Purcell



Bishekamak, deer's hoofs or trail made by those animals in the mud. Very rare pattern, once common to the Taco (Yukian) of Potter Valley. Consists of two right-angled triangles joining so as to represent the track of a deer's hoof.

Bishemao, deer's loins, the mottles on the buck's rump when struggling out of the slime of Clear Lake at the creation. Parallel lines with the inclosed space filled with dark and light parallelograms.

Bisheo, deer's teeth, seen by the primal Indians when that animal called to them for help as he struggled in the mud. A row of little squares with open spaces between.

Danokakea, Mountain Waters tribe, totem of a tribe once living six miles north of Upper Lake, in the mountains at the headwaters of McClure Creek, and a close affinity and neighbour of the Pomo of Potter Valley. A band of equilateral triangles in two colours alternating.

Ka wi na ote, or *Ka wi na mi yak*, turtle neck. A charm of halved turtle backs strung one above the other, indicated by three equilateral triangles, one resting on another.

Katsha, arrowheads often represented on the basket as strung together and worn as necklaces.

Katshak, arrowhead. A row of equilateral triangles bounded by two lines and touching by their bases, or having the apex of each one touching the middle of the base of the other.

Kawinateedi, turtle backs which were seen floating on the waves of Clear Lake. A series of rhombs adjoining one another.

Kea, quail plume. Totem of the confederated tribes of Lake County, California, especially those living in the valleys around Clear Lake. This excludes the Napo, Kabe napo, rock village; and Kura napo, water-lily village, who had no recognised totems. The Yokaia also claimed the Kea totem, being close kin to Lake tribes, though living across the range. L-shape and Z-shape designs in colour. Most common of Pomo symbols.

Misakalak, blacksnake, a totem recognised as belonging to the Shokowa of Shokowa Valley, around Hopland. Represents a snake trail. Two parallel lines near together with a sinuous pattern between.

Na wa kai, a totem consisting of a series of ponds connected by a slough. Though this tribe is totally extinct, yet the pattern is often seen in the Yokaia village, and called Beketch, or man's spit. This is a row of squares made up of dots.

Poma, red earth. Named from the mound of siliceous earth in Potter Valley, whence all Pomos sprang, and from which, to this day, their ceremonial yeast or sacrament is dug to be mixed with their bread and eaten. The totem of a Potter Valley tribe. Pomo —red (stone) mine or quarry, where argillite or magnetite is mined for wampum. A row of triangles in red splints.

Shakobiya, grasshopper elbows, or the spines on the tarsi. Trail noted in mud. It consists of a line of right-angled triangles joined at their bases.

Shakokamak, grasshopper tracks made in the mud at creation. Parallel rows of dots in fours.

Tsi yo tsi yo, up and down, the word *Ka* being understood. "Waves" rolling back from the shores of Clear Lake, releasing the new-born creatures. Three zigzag lines parallel and oblique. Certain Lake County Pomo tribes use the term tsi yo tsi yo, signifying waves, or the marriage of the east wind to the waters of Clear Lake, representing it by a series of dotted parallelograms in stepped pattern.

Carl Purdy's vocabulary of Pomo symbols on basketry is as follows:

Baiyakan (Baiyak, net), band of rectangles, called meshes; also, snake.

Bishe mao, or *mia*, backbone or ribs of a deer. Rectangles or rhombs in échelon.

Butterfly pattern, Long Valley Indian (Copehan).

Chi kakh, quail.

Dalan, halved. (Yokaia, dilan.)

Dan, opening. (Compare the path in Navaho baskets.)

Itchi cu we; len we is naked, or bare and naked; itci tcu we, bare of design—*i. e.*, not ornamented.

Ka pok poko, short design, rhomb or rectangle in the middle.

Ka tio tio, waves (Ka, water, and tio tio, rippling); or Kahio or Kalio (?).

Kailakama, crow foot (kai, crow, and akama, foot).

Kalcha misit, arrow points. (Yokaia.)

Kalen le lan, white mark in the middle.

Katcha, arrowhead.

Katcha, arrow; Katcha da lan, arrow halved; Katchi mi set (or misit), arrow points.

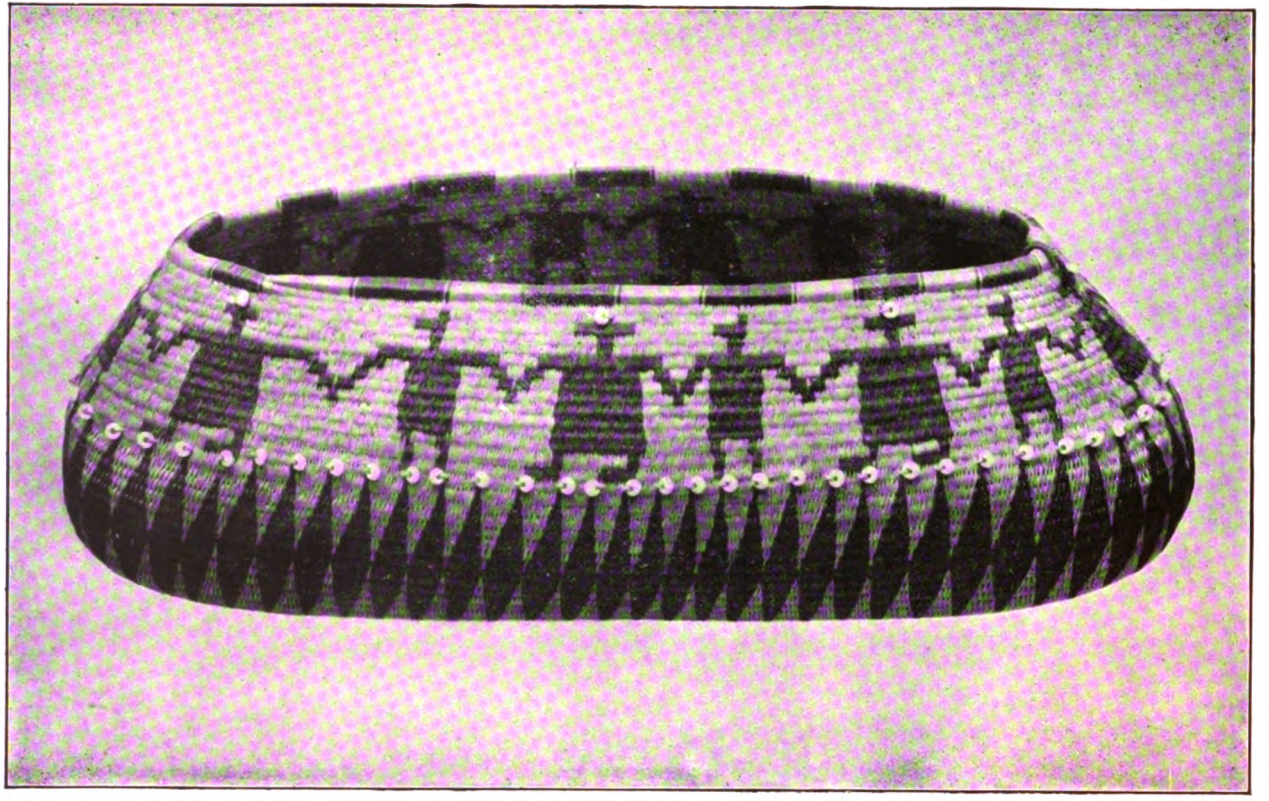


Plate 81. See page 205 GIFT BASKET OF THE POMO INDIANS, CALIFORNIA, SHOWING MEN AND WOMEN CELEBRATING THE FOOD-FALLING OR ACORN HARVEST

Collections of U. S. National Museum

Kawina ritcha, turtle neck.
Kèyá, quail tip.
Kèya, tip or top.
Lelan (lilan), in the middle.
Mato, large; Kalcha mato, arrowhead large.
Mi sit, point; or miset (?). Upper Lake Pomo.
M sa kalle, spiral, or snake; name of a certain spotted snake.
Pau shna, acorn top (Pau, corn, and shna, head).
Sakalle (Yokaia for snake).
Siot sio, zigzag, waves.
Tchikaka ke-ya, quail tip (Tchikaka, quail; ke-ya, top knot).
Una leu, crossing.
Utcha, neck.

Mr. Purdy's interpretations of Pomo symbols will be found in Dr. Dixon's paper before quoted. If the reader have a collection of Pomo baskets, an examination of the symbols on them in comparison with the Dixon plates will demonstrate what liberties the basket-weaver took with her designs. Maybe, it were better to say, what struggles she made to realise a design or symbol under general and special limitations.

Pomo (Kulanapan) Designs, Dixon's Plates

Arrow point. (Plates 29, 30, 33, 36.)
Buckeye tree. (Plates 27, 34.)
Crossing tracks. (Plates 28, 29, 34, 36.)
Crow's track. (Plates 34, 35.)
Grasshopper leg. (Plate 27.)
Leaf. (Plate 27.)
Meshes in fish net. (Plates 30, 31, 33, 34, 35.)
Quail tip. (Plates 27, 28, 29, 36.)
Red mountains. (Plates 27, 30, 31, 33, 34, 35.)
Spotted fawn skin. (Plate 27.)
Unknown designs. (Plate 32.)
Zigzag. (Plates 28, 29, 30, 32, 33, 35, 36.)

To illustrate the technic of symbolism, Plate 81, Catalogue No. 203,398, collected by Dr. J. W. Hudson, is presented. It shows a gift basket of the Pomo Indians, made by a Yokaian

woman whose name is Keshbim, who worked upon it seven months. The pattern is a pictograph of a feast, the bottom of the basket being tule mats (bitsan) interspersed on the assembly hall floor, not shown in the figure. The band of rhomboid figures around the bottom is the roof of the dance lodge with its rafters crossed and interlaced, and the dancers, male and female, are celebrating the Ma a ca ka (food-falling) harvest (acorns). The Pomos have four seasons in their year, beginning on the first full moon (tha na bu sa da, thumb moon) in July, and Sa ha nim, smoke floating time, has four moons; Ma a ca ka has three moons, beginning with Ba too da, index moon. Kat sa na, green earth, has three moons, and Kat sa mi, green-things time, has three moons. This basket, under the old régime, would have been presented to some friend during the feast, demanding a very handsome return, for no one appreciated a fine piece of work like a Pomo woman. The foundation is of willow rods. The sewing is not done with linen thread, as one would suppose, but with roots split so fine that in some places the sewing shows sixty stitches to the inch.

Dr. Dixon has made careful personal investigations concerning the symbolism on the basketry of California tribes east of the Sacramento River.* The following designs with their tribal assignments may be found in Dr. Dixon's plates:

WINTUN (COPEHAN) DESIGNS

Arrow points. (Plate 23.)
Bear's foot. (Plate 23.)
Bent elbow. (Plate 23.)
Cross Waves. (Plate 24.)
Deer excrement. (Plate 24.)
Empty spool. (Plate 24.)
Fish tail. (Plate 23.)
Flying geese. (Plate 23.)
Leaves strung. (Plate 24.)
Pulled around. (Plate 24.)
Rattlesnake. (Plate 23.)
Striped. (Plate 24.)
Water snake. (Plate 23.)
Wolf's eye. (Plate 23.)

* Basketry Designs of the Indians of Northern California, Bulletin of the American Museum of Natural History, XVII, pp. 1–32, 37 plates.

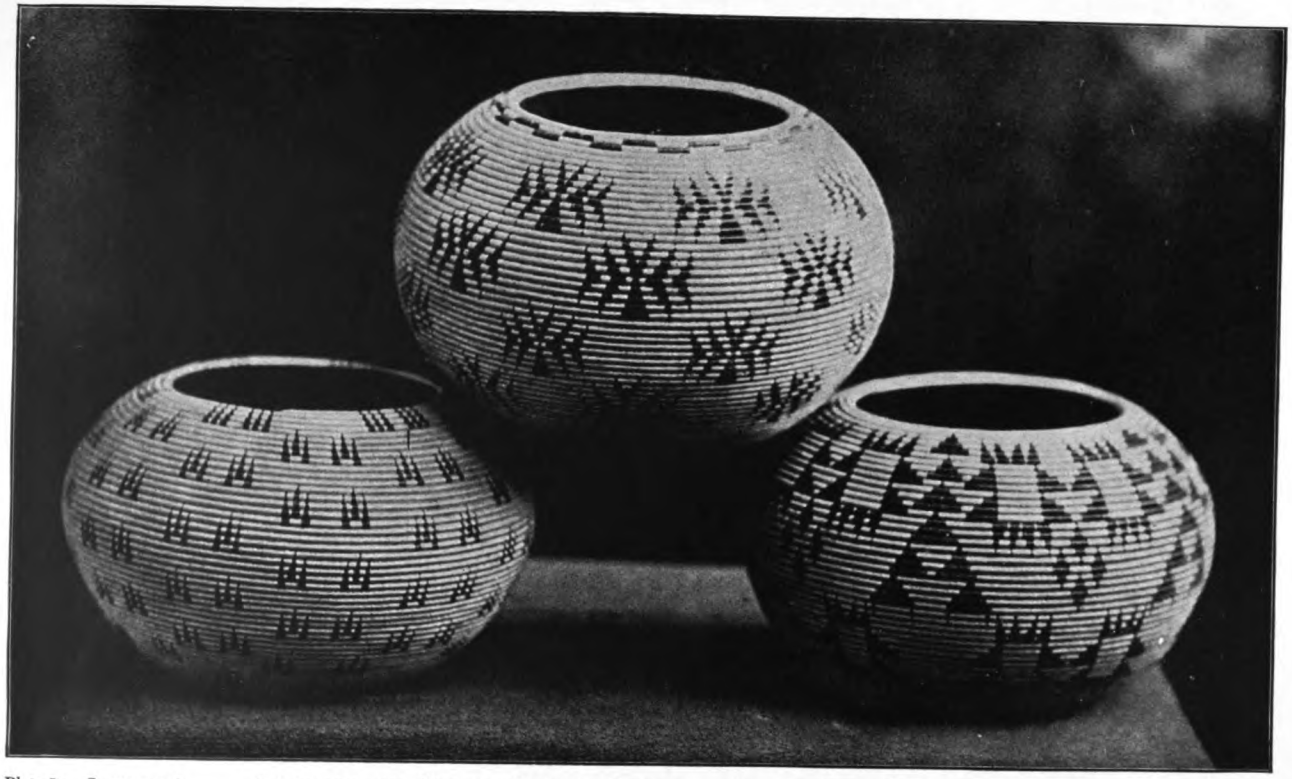


Plate 82. See page 208

SYMBOLISM ON WASHOE BASKETS, NEVADA. DESIGNS MEAN RISING SUN, MIGRATING BIRDS, AND INHERITANCE

Collection of A. Cohn

Moquelumnan Designs

Eye. (Plate 26.)
Quail tip. (Plate 26.)

Pit River (Palaihnihan) Designs

Arrow point. (Plate 22.)
Lizzard. (Plate 23.)
Skunk's nose. (Plate 22.)

Maidu (Pujunan) Designs

Deer excrement. (Plate 25.)
Earthworm. (Plate 25.)
Rattlesnake. (Plate 25.)
Water snake. (Plate 25.)

Nozi (Yanan) Designs

Wolf's eye. (Plate 25.)
House. (Plate 25.)

Dr. Dixon's conclusions are of interest. Designs are subject to much variation, chiefly through different arrangements of elementary and constant forms in the pattern. If there are two or more types for the same element, they are never found together. Designs are essentially the same on coiled and twined basketry, but most of the Maidu baskets are coiled, and there is suggestion of acculturation from the Pit Rivers. Function and form of the basket have something to do with symbols, certain designs being restricted to plaques, others to soup bowls, and so on. The spiral line is a favourite in massing symbols. Some of the patterns are found everywhere in the Maidu area, others are quite restricted. In most cases (and this is the universal testimony) the intent of the design is not clear from mere inspection, but must be explained before it can be understood. The author's summary of Maidu symbols is the very large variety and number, the frequency of animal designs, the unusual predominance of plant designs, the number in which the realism is obscured, the tendency to spiral and zigzag patterns, and the well-nigh universal practise of putting but a single design on a basket.

Plate 82, fig. 1, is a Washoe basket 8½ inches high, 12 inches wide, and 6 inches across the opening. There are thirty stitches to the inch. Colours, red, black, and brown. Weight, 16 ounces. The legend is named "Migrating," or "When the birds leave their nests and fly away we shall move." The lower left-hand basket, fig. 2, is 7 inches high, 11½ inches across, and 6 inches over the opening, with thirty stitches to the inch. The body is light-gold colour, and the ornamentations are in red and black. Weight, 15 ounces. The legend is, "Rays of the sun ascending." An attempt to imitate the radial appearance of the light at sunrise. The lower right-hand basket, fig. 3, is 7 inches high, 6 inches across the opening, and 11½ inches in diameter, with thirty stitches to the inch. The body is light-gold colour, and the decorations are in red and black. Attention is invited to the intricate combination of squares and triangles, stepped patterns, and rhombs to form the total design on the surface. These symbols relate to the different ranks or degrees in the chieftaincy of the tribe which they are entitled to receive by inheritance. This information is based on the studies of A. Cohn, of Carson City, Nevada.

Plate 83 is a Tulare bottleneck, collected on Tule River, Tulare County, California, and is in the collection of C. P. Wilcomb. The material and sewing are similar to those in other Tulare baskets. The ornamentation deserves especial attention. The bands of rhombs on the body and the part on the upper border, which resembles the shaftment and feather of an arrow, are common to the region. On the middle of the body, however, is a band of ornamentation which resembles the Egyptian ankh. It is useless to speculate on the origin of this symbol, since the Indians in this part of California have been in touch with the Latin-American race for centuries. In this Inyo-Kern-Tulare subarea, Dr. C. Hart Merriam finds the crenelated design to be associated in symbolism with the spasmodic flight of the butterfly as it flits among the flowers (see

Plate 83. See page 208 TULARE BOTTLE-NECK TREASURE BASKET, SHOWING MIXED SYMBOLISM

Collections of C. P. Wilcomb

Plates 41, 188, 192, 194), and calls attention to the dispersion of the symbol as far north as southeastern Alaska. Miss DuBois calls attention to an interesting series of basket symbols representing the harvest dance, bought by her at Campo, a little border village of the Missions. In the *American Anthropologist* for January–March, 1903, a Pima conventional symbol, T-shaped, stands for the drinking festivals, marking the saguaro cactus harvest at the beginning of the year.

Designs were found by Dr. George H. Pepper* on the ancient basketry from the caves of southeastern Utah. He refers them to symbols as they are now understood among living tribes, but recognises that such forms do not stand for the same object always, even in the same tribe. The designs given are the butterfly of the Maidu, water-fowls, mountain, and sun. A glance at the beautiful workmanship and at the designs on Dr. Pepper's specimens at once places them not in the Ute or Shoshonean family, but with the exquisite basket-making tribes westward in California. They have the three-rod foundation. The upper one is 17½ inches in diameter and 5 inches deep.

The basket having the butterfly design was found over the body of an infant, and this led the finder to the conviction that the forms had some mythic significance. These specimens, and many more, belonging to the Wetherill, the McLeod, and Graham collections, are now in the American Museum of Natural History, New York (see Plate 84).

The Pueblos, called Hopi in northeastern Arizona, were visited by the Spaniards in the early part of the sixteenth century. Having no gold to tempt the avarice of the conquerors, they were let alone. On their coiled and wicker baskets, used in their religious ceremonies, are shown the personages and phenomena most intimately associated with their

* The Ancient Basketmakers of Southeastern Utah, Guide Leaflet No. 6 of the American Museum of Natural History.

cult. I am indebted to Dr. J. Walter Fewkes for the interpretation of their symbolism.

The basket shown in Plate 85 is peculiar to the Hopi village of Oraibi; has a picture of the Corn Maiden (Shalakomana or Palahikomana). The head bears the representation of a tablet which is symbolic of the rain-clouds. The colours represent the rain-clouds of the four cardinal points: Yellow, the North; blue, the West; red, the South; white, the East. Usually in representations of this maiden, the Hopi hair-puffs are represented. A design on the forehead stands for an ear of corn, which is one of the symbolic marks of this maiden. There ought to be represented in the middle of the forehead, dependent from this ear of corn, a fragment of Haliotis shell. This is for the rainbow. The two eyes appear as bands, and should be of different colours, the left green or blue, the right red. The two bands below the eyes are meant for facial markings, which are generally triangular in shape. Green and red stripes on the chin represent the rainbow. On paintings, the bow is curved the other way, but the restrictions of basket-making require the curve to be downward. The blanket on the body is a garment made of feathers, the individual feathers being represented by blue and red bands. This is the earth goddess, or corn goddess. Interesting descriptions of the ceremony in which she is engaged will be found in Dr. Fewkes's interesting paper* on the Minor Hopi Festivals. On Plate 24, opposite page 494 of his article, is illustrated the Palahikomana dance. She is shown as the central figure. The head-dress, body garment, and embroidered blanket are represented in full. The head-dress is decked with feather plumes, and altogether the appearance is more striking. The basket weaver has done her best where her pictorial ability gave out, at least, to indicate the presence of even the clan markings on the face, which in the drawings picture the human hand.

The top figure, Plate 93, shows the birds of the four car-

* American Anthropologist, N. S., IV, 1902, pp. 482–511.

dinal points, two very much enlarged and two smaller. The stripes on the border are the tail-feathers of the larger birds. The limitations of the basketmaker are well shown in the specimen, in that all perspective is neglected and every part of the body brought to the same plane; the feet are turned around so as to show the toes.

The lower figure in the same plate represents one bird, the head on the upper margin having rain-cloud appendages, the beak being represented by an extension on the right-hand side. The wider symbolic colours are abbreviated in every part. The bend in the knee is shown by the rectangular spaces representing the leg (see Plate 93).

The basket shown in Plate 47 was made at the Hopi village of Oraibi. The symbols on this basket represent the sky birds of the four cardinal points, two of which are larger, two smaller, apparently made so for want of room. The central figure represents the heart of the sky with geometrical rain-cloud figures. The sky god has a number of names.

In the upper figure (see Plate 216), the designs have gotten past the pictorial stage, and the meaning could be known only by consulting the maker of the basket. It is doubtful whether she did any more than what she saw her mother do. It might be possible, if a large series were had, to follow this symbol outward to the known pictorial form.

The lower figure in this plate represents the four birds of the cardinal points. The standard colours of the cardinal points are not all in the design, because the basket itself is yellow, which deprived the workwoman of the privilege of representing the North. The symbol is very highly conventionalised.

The figures on both examples, Plate 30, denote rain-clouds.

The same types of symbolism, occasioned by the climate, the physical features and productions of the arid region, will

be found at Zuñi and among the Rio Grande Pueblos.* Symbolism on the basketry of Middle and South America has not been worked out.

In closing this meager chapter, the author calls attention to the fact that symbolism, or giving sensuous representation to spiritual ideas, is wider than basketry or any other class of useful objects In order to reach substantial results, the subject must be taken up comparatively. For such a profound study many of the plates in this work will aid substantially.

* F. H. Cushing, A Study of Pueblo Pottery, Fourth Annual Report of the Bureau of Ethnology, Washington, 1887, pp. 467–521.

For a fuller explanation of the rich symbolism surviving in the Pueblo region the reader must consult the papers of J. W. Fewkes, to be found illustrated in the American Anthropologist, N. S., V, 1899–1903, and in the reports of the Bureau of Ethnology.

A Study of Textile Art in Its Relation to the Development of Form and Ornament, Sixth Annual Report of the Bureau of Ethnology, Washington, 1889, pp. 189–252; also, Prehistoric Textile Art of Eastern United States, Thirteenth Annual Report of the Bureau of Ethnology, Washington, 1896, pp. 3–45.

CHAPTER VI

Uses of Basketry

Blessed shall be thy basket and thy store.
—Deuteronomy, XXVIII: 5.

Nature has provided members of the animal kingdom with receptacles which are a part of their anatomy. The camel has its water cells, the ruminant animals have their extra stomach for the storage of grasses, the squirrel carries nuts in the pouch in the side of its cheek, and certain insects are provided with various means for transporting food to a distance. It remained for the human race to invent appliances to accomplish similar results, and basketry forms one of the principal means adapted to such needs. There is practically no limit to the uses to which basketwork weaving has been put. The enumeration of these uses in detail will show what a prominent place the receptacle has had for holding water, food, and other precious objects, for gathering the materials connected with industry, and for transporting them. Basketry also enters into the house, the furniture, the clothing, the armour, the domestic economy, the family life, and the religion of the American tribes.

There are a multitude of secondary uses of baskets which will be mentioned in the proper place. Certainly they have done as much as any other industry to develop, in the intellectual life of savage women, both a knowledge of the resources of nature and a taste for esthetic products. It will also be found that there is no gulf between basketry, beadwork, lacework, and loomwork. There are times when the basket-weaver suspends her work and, with the use of her

fingers alone, imitates the products of most complicated weaving frames. The highest steps in basket-making will be the first steps in the great mechanical art which now costs so many millions of dollars and employs so many human beings.

Before the coming of the European, basketry supplied nearly every domestic necessity of the Indians, from an infant's cradle to the richly decorated funerary jars burned with the dead. The wealth of a family was counted in the number and beauty of its baskets, and the highest virtue of woman was her ability to produce them. Some domestic vessels were named for the particular service they performed; as bi-ti-bo-um′ (dishes), or Ká-dem (water-giver) among the Pomos; but the majority were known by their weave or shape. Vessels of the Tee weave, says Hudson, bore the brunt of culinary usage, as pots, pails, roasters, etc. There were two varieties of sifters; the coarse pshu-kan′ separating the crumbs for nut cake, etc., and the ma-a-po′-i, or finer sifter (a conoid utensil), which, slightly tilted and struck sharply within by the finger tips, spills the chaff over the outer margin.

The great value of her work reflected upon the maker herself. It was the most expert woman in basketry, says Miss Jennie C. Carr, who brought the highest price, namely, two strings of shell-money.

Of old basketry some examples are clean, while others are soiled and dilapidated. The former had the good fortune to fall into careful hands half a century ago, when they were new, and have with the years merely faded down to their indescribable shades. The other precious old pieces have been

> Dipped in baths of hissing tears
> And battered by the shocks of doom.

The study of structure in basketry, as in other activities, leads to investigations concerning functions and use. Among

the least favoured tribes in this regard there is a similarity to the lower forms of animal life where the same structure performs a number of processes. It is also common to see, among the plainer sorts of people and the uneducated, one utensil used for many purposes. So with the little-advanced tribes of Indians there will be one technical process in basket-making and very small variety of forms for many uses, but when the more advanced and skilful tribes are reached, there is a differentiation of function and along with it corresponding differences in structure and technical processes even in the same piece.

In the study of function there are two inquiries of equal value, namely, (1) the geographic distribution of functions together with the particular types of basketry that are used to perform these offices from place to place, and (2) tribal origins and purposes in order to connect function with ethnological and geographical studies. In each one of the six areas into which the Western Hemisphere has been divided, the uses to which baskets are put will be decided by the animals, plants, and minerals that are indispensable to the happiness of the people, and the forms and characteristics of the baskets will depend upon the plants that are to be had for making them. On the seashore there must be clam baskets and fish baskets. In the interior there will be berry baskets; and in those regions where no pottery is to be found, cooking baskets, in which food is boiled by means of hot stones, are among the commonest objects in sight. From the other point of view a more subtle question arises, whether ethnology has anything to do with basket materials or things to be carried in them. In tracing the history of invention during its primitive stages it will at once be recognised that the art of basket-making was greatly stimulated by the multiplication of ends to be served; that the inventive faculty, having such a versatile and

accommodating material, found scope for its own enlargement and improvement. In the end it becomes apparent that the art and the artist have set themselves one to the other "like perfect music unto perfect words." The basket adapts itself to the woman's life. It is not easy to pin any special structure upon a definite tribe, however, since women were captured or ran away mayhap into other tribes. A quiet system of pedagogy was going on all the time in basketry, as well as in other activities. The uses of basketry will be given in further detail, the topics arranged in alphabetic order.

An interesting phase of the struggle between use and beauty is to be seen in the compromises which they make for space on the same basket. The jewel, the cremation *chef d'œuvre*, or the precious gift to a friend, may be covered with designs, having the most beautiful on the bottom, or where the maker's fancy led her. On the other hand, the piece for common use is the despair of the artist; it is bereft of ornament. Among the Tlinkit of southeastern Alaska, while the covered trinket-baskets are decorated to the ground, the cylindrical food-baskets are plain near the bottom, and in many examples half the way up the body. This compromise in decoration is more apparent in the heavy coiled work of the British Columbia tribes. Boxes for show, cradles, and such examples are surrendered to the decorator, while the berry baskets and cooking pots have their adornments chiefly on the upper portion of the body. This fact limits the motives in the design. On old pieces it is melancholy to see how the hard wear of years has invaded the sacred precincts of art and destroyed even the symbols of religion. On the California basketry, art was predominant. The spirals descend nearly to the bottoms of the mush bowls and the carrying baskets, but a glance reveals at the point of strain a patch of ordinary strong weaving or a protective covering.

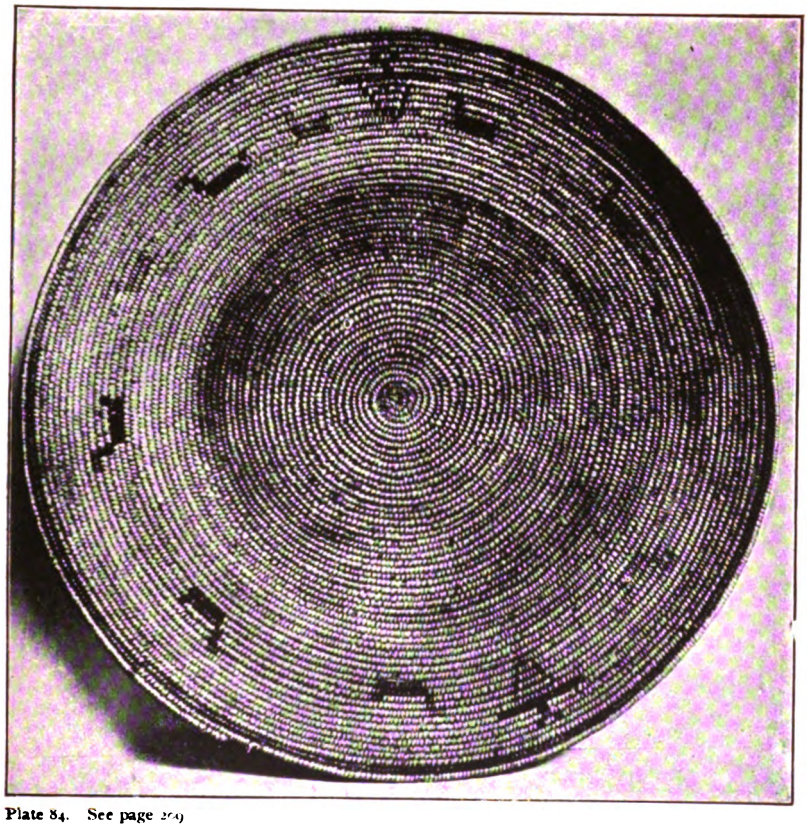


Plate 84. See page 269

SYMBOLS ON ANCIENT CLIFF-DWELLERS' COILED BASKET, UTAH. BUTTERFLY AND DUCK DESIGNS

Collections of Am. Mus. of Nat. History, N. Y.

As previously mentioned, baskets are receptacles of some kind or other. They do not of themselves usually perform work, but are used for holding the materials and apparatus of work. The art of basketry, however—that is, the plication or working of somewhat rigid materials—easily passed out of the mere making of receptacles into the construction of all sorts of objects needed in daily life.

The uses of basketry are either industrial or ideal. Industrially, they are connected, first, with the whole range of obtaining food or nourishment and the other natural materials upon which all history depends.

With the secondary industries, called manufactures, with transportation, and with consumption or enjoyment, one has but to take a stroll along the crowded dock, as in a great seaport or the busy warehouse of any modern city, to become familiar with the infinite number of ways in which the basket lends its services to the comfort of the human race.

All of these functions, so intricate and diversified in civilisation, are represented in savagery by much more simple occupations, from which, however, the basket is never absent.

Beyond the drudgeries of life lie its beatitudes, and here the basket is also present. In fine art, in social functions, in birth, in lore, in custom, and even in burial it is not absent.

A detailed description of the way in which these functions are performed by basketry, with abundant illustrations, will show just what is meant in these declarations.

In the Carrying Industry

Carrying in baskets was done by the Americans on the head, on the back with head-band or breast-strap, and in the hands; about the home, the basket was scarcely ever absent. It was the strongest of all Indian fabrics, easily made into any shape convenient to the load or the carrier, and it was lightness

itself. In a hemisphere almost devoid of pack-animals, where woman was the ubiquitous beast of burden, is it any wonder that she invented the most economical of devices for holding and transporting? Since nothing grows where it is wanted, an attempt to enumerate the things transported in baskets would be to list every natural material that contributed to the Indian's happiness. Mineral, vegetal, and animal substances are all in there. Clay from the quarry, water from the spring, stones for working, firewood, edible roots, fruits, and seeds, textile materials, fish, flesh, and fowl are a part of the freight ever on the move throughout the culture areas.

The carrying basket did not lose its multitudinous functions for women with the departure of savagery. One has only to look into market-houses and stores, walk along the streets, or visit farms in the country to be convinced of this.

They are borne on the head, shoulder, hips, or knees; they are hung to the body in every possible fashion, and carried by two or more persons with the hands—all for loading ships, cars, or wagons. They are used also as panniers on the backs of animals, and smaller and better specimens are used by the interminable procession of children and buyers and travellers.

The transportation basket did not cease as a stimulus to invention, with its holding things and spurring the maker to do her best in its composition. It waked up her mind in other directions. Her feet had to be fitly shod to gather materials; thus sandals were often made in basketwork. Her clothing required adjustments to new occupations and exposures in the new activities made possible by the art. Even the baskets of other functions were perfected and new functions were created by the carrying art.

In the Report of the United States National Museum for 1894 * a large number of illustrations are devoted to showing

* O. T. Mason, Report of the United States National Museum, 1894, pp. 237–593, pls. 1–25, figs. 1–257.

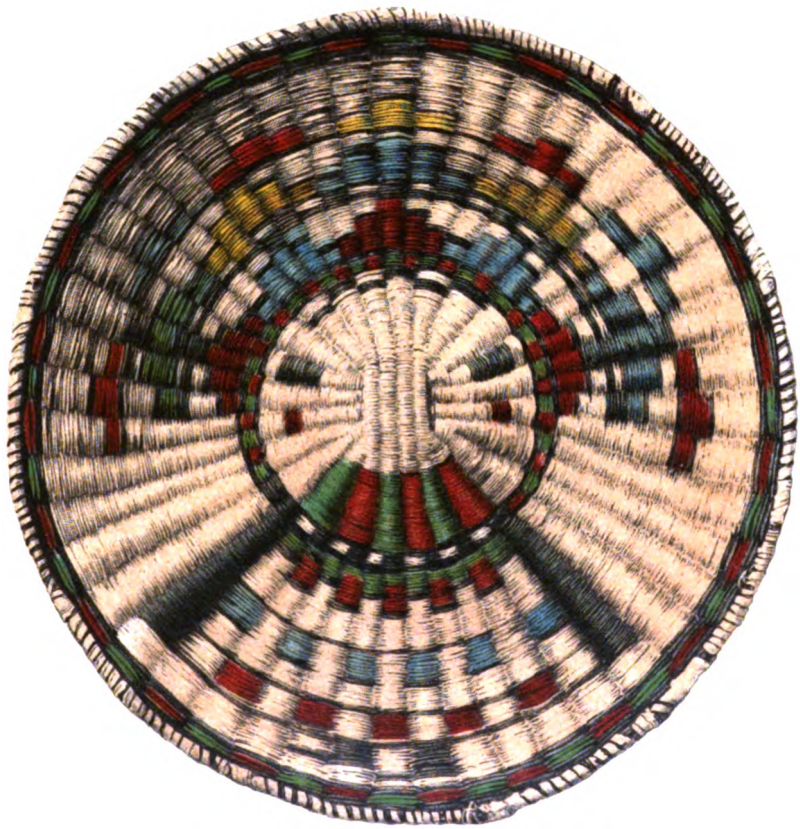


Plate 86. See page 219

AGED HUPA BASKETMAKER AND BURDEN BEARER, WEARING FINE HAT

Photographed by A. W. Ericson, Arcata, Cal.

the variety of ways in which baskets may become vehicles among the aborigines of our hemisphere.

Edwin Bryant describes the moving of a Sioux camp, near Fort Laramie, in 1846.* The tent-poles were fastened to the sides of the ponies for *travaux*. Crosspieces were lashed to these, and small children were confined in cages, made from willows in the form of crates for crockery, having doors on the sides.

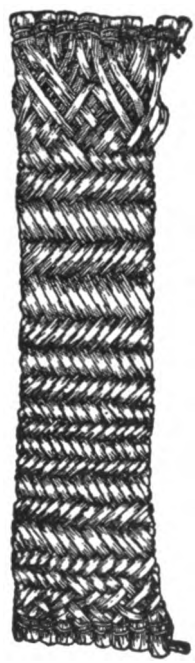


FIG. 105.
BREAST BAND FOR HAULING.
Zuñi, New Mexico.
Cat. No. 70,962, U.S.N.M.
Collected by James Stevenson.

The Moki, or Hopi, Indians of to-day, in addition to the woven head-ring and the ordinary head-straps for carrying loads, have in use a breast-band of yucca fiber for dragging loads over the ground. (See figs. 105 and 106.) The Papago women fit a lace-work frame to the back in carrying loads for long journeys. (See fig. 106.)

The Apaches make a special pannier in twined work, one of which will fit the human back, and two may be used on a donkey.

The Totonacs, of Vera Cruz, make soft carrying bags in twined weaving.

Plate 86, from a photograph by A. W. Ericson, represents a Hupa Indian woman using the carrying basket for firewood. On her head she wears one of the beautiful little conical basket caps of this tribe, common in collections. A band of leather passes across her forehead, and the load of wood is supported on her back. There is no other function of basketry so universally widespread as this.

According to Muhlenpfordt, the Pimas and Maricopas make a basket boat, which they call "cora," woven so tight as to be waterproof without the aid of pitch or other

* Rocky Mountain Adventures, p. 110.

application. And upon the same parallel of latitude, along the Gulf of Mexico, the Indians used to cross the rivers on floats of cane woven together and called "cajen." Bundles of cane were laid together sidewise, and over them others, the whole being woven together.*

FIG. 106.
CARRYING FRAME.
Papago Indians, Mexico.
After W J McGee.

Formerly mats were used by the Makah as canoe sails, but at present they are employed for wrapping up blankets, for protecting the cargoes in canoes, and for sale to the whites, who use them as lining of rooms, or as floor coverings (James G. Swan). Besides the endless carrying of things among the Indians, called transportation, there is, it must not be forgotten, a large amount of passenger movement. The cradle, or, more correctly, the papoose basket, was the beginning of devices for carrying persons. Except a little riding by people of note on the backs of men in the Andes, only infants were passengers in aboriginal days throughout America.

For the infant there were three zones of going about in the Western Hemisphere—the Arctic, the Temperate, and the Tropical; speaking technically, the zone of the fur hood,

* Du Pratz, History of Louisiana, London, 1763, II, pp. 228–229. Dumont also mentions rafts of poles and canes.

the zone of the carrying frame, and the zone of free motion. The Atlantic province tribes made use of flat boards, or racks; the Eskimo mother carried her babe safely ensconced in her ample hood of fur. The cradles of southeastern Alaska and the mainland near by were troughs, but most of the Pacific tribes made their papoose frames of basketry, and it is to these that attention is invited. In nearly all of them the feet and head are left free.* The Hupa Indians, on the Hupa Reservation, in northwestern California, belong to the Athapascan family in Alaska and northwestern Canada, and that may account for the resemblance of their cradles in form to those of birch bark made by the tribes of that northern region. Structurally, they are in plain twined weaving, with here and there a row of wrapped twine and false braid. In passing, it may be noted that these Hupa babies are not strapped on a board, as among the eastern tribes, nor are their heads bandaged, as are those of the tribes along the coast of British Columbia.† (See fig. 107.)

FIG. 107.
TWINED CRADLE.
Hupa Indians.
Cat. No. 126,519, U.S.N.M. Collected by P. S. Ray, U. S. A.

* O. T. Mason, Primitive Travel and Transportation. Report of the United States National Museum, 1894, p. 521.

† See Report of the United States National Museum, 1887, p. 178, fig. 11.

In Defense and War

Basket armour of the tribes on the Pacific coast is made of narrow slats of wood, recalling those in the bottoms of some of the Lillooet Indian baskets in British Columbia. The slats are associated with straight rods of hard wood. These are woven with cords in regular twined weaving. The twine is finely spun and laid on so as to produce an ornamental

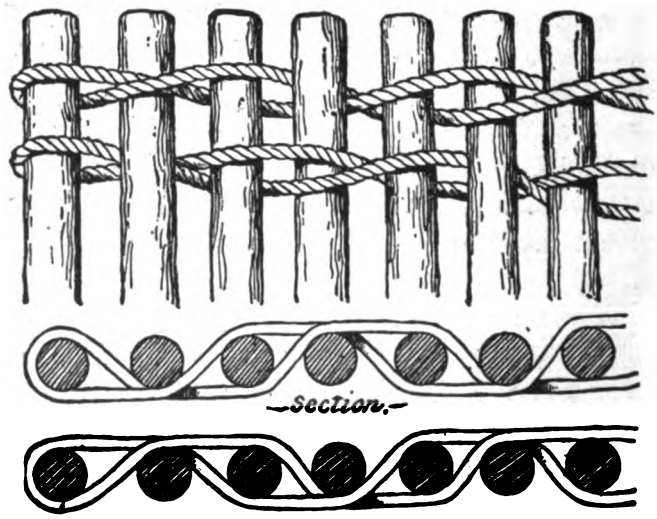


Fig. 108.
STICK ARMOUR TWINED TOGETHER.
California.
After W. Hough.

effect upon the surface. This basket ornament has been found in caves of the Aleutian Islands, also among the Tlinkit Indians of the Pacific coast as far south as the Hupa Indians of the coast of California. In some specimens wicker weaving takes the place of twined weaving.*

An examination of Hough's Plates 7, 8, 9, 10, 11, 13, 14, and 15 will show how the weft of twine in basketry is trans-

* Walter Hough, Primitive American Armour. Report of the United States National Museum, 1893, pp. 625–651.

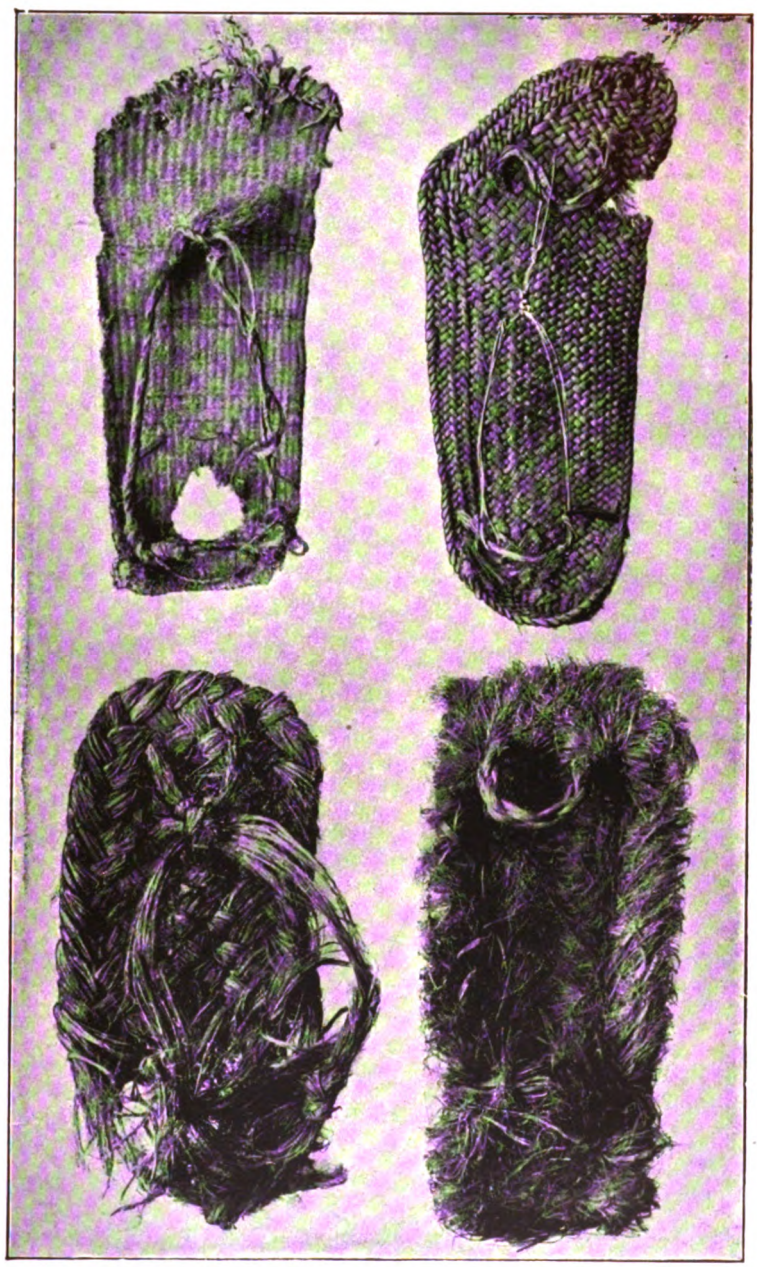


Plate 87. See page 223

SANDALS OF ANCIENT CLIFF-DWELLERS, COLORADO, SHOWING STYLES OF WEAVING

Collections of U. S. National Museum

ferred to slat armour, worn anciently by the Tlinkit, Aleut, Takoo, Shasta, Hupa, and Klamath Indians.

Fig. 108, reproduced here, illustrates one in which the twined basketry was applied to this sort of armour.

The Massawomekes, on the Chesapeake Bay, had similar basket shields or armour. Smith * speaks of them as made of small round sticks woven "betwixt strings of thin hempe and silke grass," but so firmly that no arrow could possibly pierce them. Comparing this description with the figure above leaves no doubt of the similarity of the defense on both sides of the continent.

In Dress and Adornment

Basketry, laying aside its chief function of holding something, is even now used extensively among many tribes in dress and adornment of the person. It was mentioned in the section on carrying that the exigencies of going about stimulated the inventive faculty not only in the basket industry, but in other crafts accessory to travel. The foremost of these companion arts is that of sandal or shoe maker. It is true that boots of hide and moccasins of tawed skin are the commonest supply of this want, but there is a vast portion of America where the sandal holds sway. They are made of tough fiber and woven in wicker, checker, twill, twined in a number of fashions. Some of the Cliff Dwellers' sandals are studies in weaving three and even four ply. Many of them are figured in my paper on Primitive Travel and Transportation.† (See Plate 87.)

But, far more than the feet, the head claims the basket-weaver's art the world over. In America the basket hat clings to the Pacific slope. As soon as the Indian area is reached in southeastern Alaska, the hat reaches its acme. It is made not only for comfort, to save the eyes of the hunter

* John Smith, History of Virginia, Richmond, 1819, p. 185.

† Otis T. Mason, Primitive Travel and Transportation, Report of the United States National Museum, 1894, pp. 237–593.

from the glare, and to act as an umbrella, but the handy weaver, having first scoured the earth for the most delicate spruceroot, exhausts her artistic skill in its composition. The Tlinkit woman and the Haida woman solve the problem differently. Given the task to make the most elegant hat that can be done in spruceroot, the Haida artist relies upon her delicate fingers to get the result. Twined weaving is her technic, but plain and twill and three-ply are so happily blended that she discards colour. The Tlinkit, just a whit less refined in touch, or maybe not having such perfect material, resorts to colour. The designs are not always wrought, but are frequently painted, while beard of seal, abalone shell, and beads exhaust the possibilities of decoration. These hats are made for men as well as women. Indeed, the finest are doubtless made for men to wear on the chase, with the conviction that a hunter must not only do his best but wear his best.

The use of the basket in clothing reaches its climax in the California hats. In a description of the costume worn by Hupa Indians in northern California, a large collection of designs on their basket hats is shown in Plates 3, 4, and 5 in the Ray collection, from the Hupa Reservation,* and on Plate 6 of the same paper will be shown the relation of basketry to footgear. (See Plate 88 for Klamath sandal.)

Excepting the headgear and the footgear, the American Indian in places needed protection from rain and cold. The robes made from the tender skins of rabbits and other small animals, by cutting them into strips and making them into blankets, by twined weaving, were widely diffused in North America from Virginia to the Pacific. Wherever the tough cedar bark abounded, soft capes and robes were made therefrom by the same women who made the baskets. The rain cloaks of middle America, if they are not of oriental origin, are knotted, and do not belong to basketry. Other basketry dress

* Smithsonian Report, 1886, pp. 205–238.

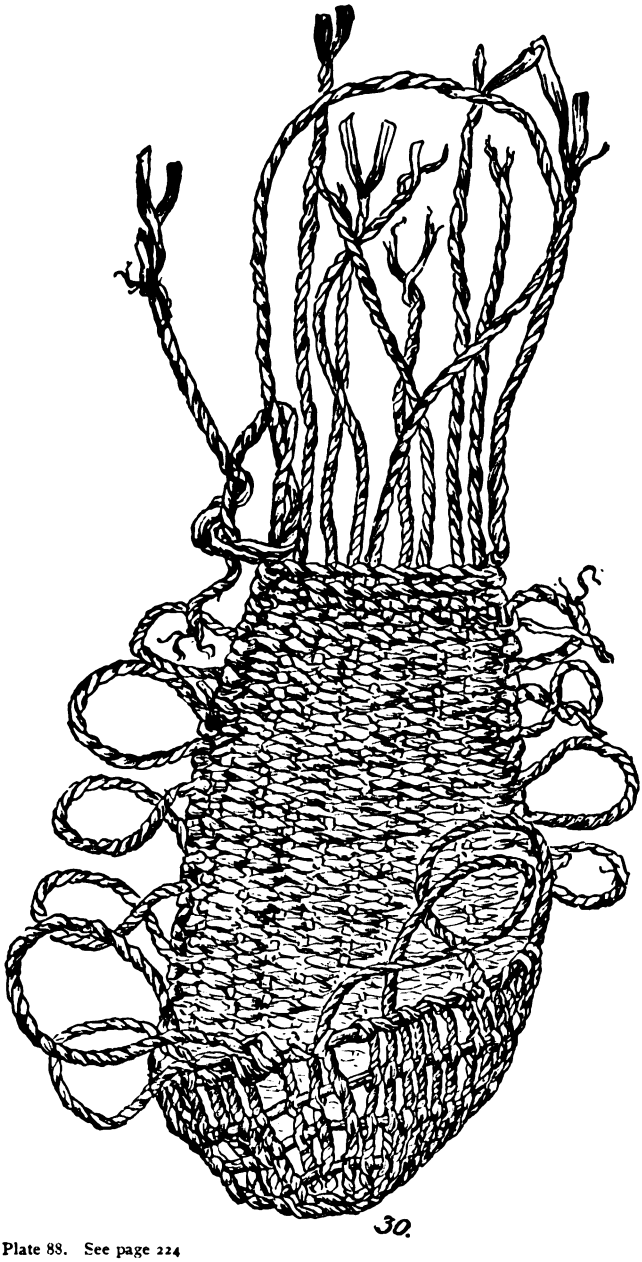


Plate 88. See page 224

KLAMATH TWINED SANDAL FOR WALKING OVER STONY GROUND, CALIFORNIA

Ray Collection, U. S. National Museum

Plate 89. See page 225

TULARE AND KERN COILED CUP AND JAR

Collection of Mrs. E. Greble

was chiefly ornamental. Leggings reaching to the knees, made up by well-known processes, are to be found. A great deal of ceremonial regalia, even that from buckskin, is put together by basketmaker's processes.

In Fine Art and Culture

Basketry has been most useful as the patron of fine art and culture. Like all other human activities, it passes from the homely useful to the useless beautiful, and in so doing combines the two qualities whose union was long ago said to be the acme of excellence. The best art critics will say that in many of her productions the American Indian woman had, by obeying the voices within, attained a high degree of excellence. The practice of this superb work, and the admiration of it, elevated her; her abject state is not her fault.

There is no doubt that in the centuries of sorrow the Indian men have suffered more than women, since all their old occupations in which they excelled have been destroyed, and hope with them; but the pride of excellence remained with the woman, who easily surpassed the whites in the work she was allowed to continue. That thousands of children are now being taught her art is witness of this.

Plate 89 shows two coiled baskets from Tulare and Kern counties, California, specimens of the combined art of three or four well-known basket-making stocks, who have united at this point—the Shoshonean, from the east, the Mission Indians, from the south, and the makers of coiled basketry, from the north. In the upper figure the basket bowl is in open sewing over a grass foundation, with ornamentation in plain, vertical stripes. Every item of form, colour, and design in this specimen has in it the true element of art.

The lower basket is jar-shaped, in closer weaving and more uniform in texture, but its design is especially attractive. The base is a rectangular outline, but the pattern is made up of hour-glass form flanked by two triangles. The body colour

is that of the material, the hour-glass is black, and the triangles in reddish brown. Especial attention is called to this figure. It occurs many times in the basketry in the Merriam collection. It is also seen in McLeod's specimens from the Kern County tribe. The symbolism is not known, nor is there any attempt at imitation of natural objects in these figures, which are natural size in the plate.

Plate 90 shows the resources of the western California tribes of Mendocino County for heightening the beauty of ordinary coiled basketry. The abalone shell, having been ground away from the back, the nacreous surface becomes one of the most beautiful natural objects. The beadlike ornamentation around the edges is the money of the tribes, the feathers are the crests of the partridge, and forming the body of the basket the plumage of various species of birds is sewed on in bands. These objects, of course, have no other value than to show the taste and skill of the maker, and they are chiefly employed in making presents to friends, who are expected to give something quite as good in return.

Emulation in esthetic ideals and technical skill, a potent factor in education and refinement, found unrestrained opportunity in basketry. It is doubtful whether pottery excelled this art in the demand for scrupulous care in every movement. Many of the best pieces in California ware are marked with the monogram of the maker; and these special marks are often at the bottom of a piece, as if the artist with consciousness of excellence had felt the Horatian thrill when the poet wrote: *Sublimi feriam sidera vertice.*

A sense of beauty in detail was the motive which led the basketmaker to search the fields and dig into the earth for fibre. It educated her mind and sharpened her judgment. In order to secure the plume of the quail, the crest of the woodpecker, the shoulder tips of the blackbird, the mottled feathers of the duck, and more, the woman must catch her birds. So she becomes an inventor, more dangerous than the

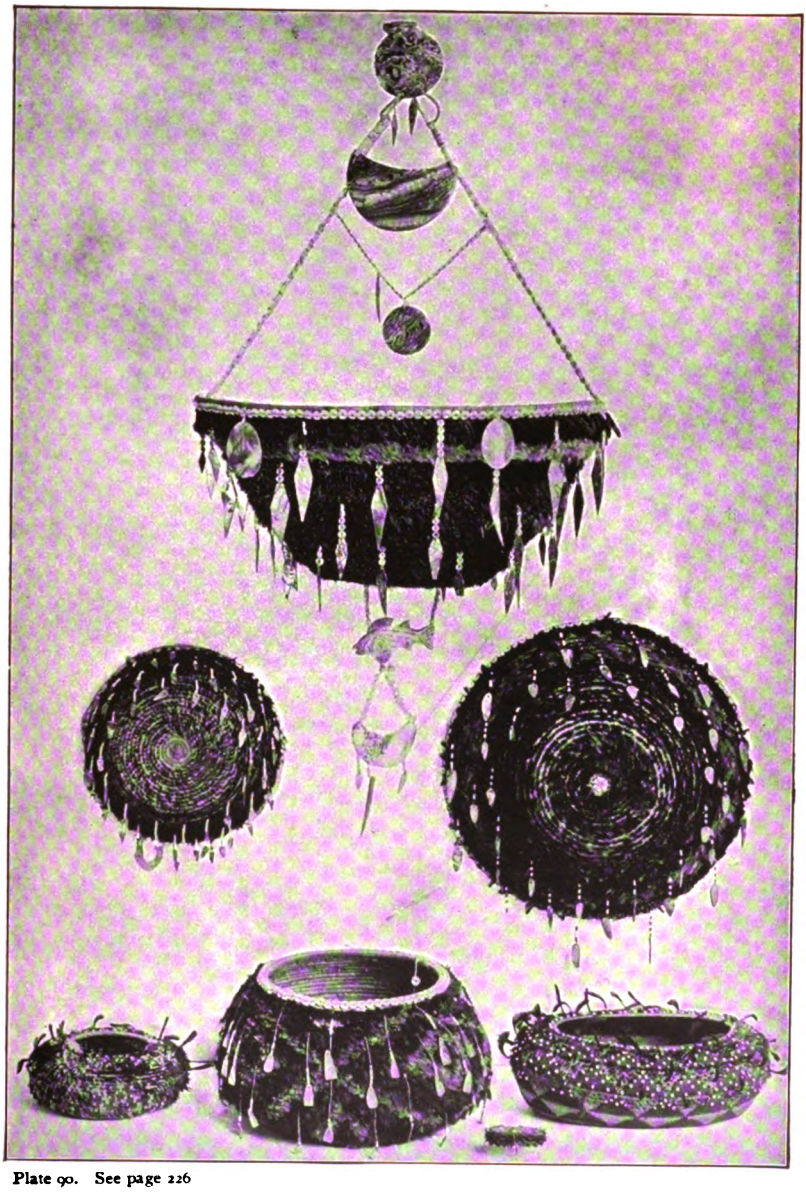


Plate 90. See page 226

COILED BASKETS OF THE POMO, CALIFORNIA, CALLED FEATHERED JEWELS

Collections of U. S. National Museum

owl, more skilful than the hawk, more subtle than the serpent. At first the inventions were crude enough, but effective in damming the waters and barricading the air. Ministering to these called forth a new grade of artificialities; culture grew by what it fed upon until it is not possible to comprehend in one grasp the multitude of materials, the variety of technical methods, the shapes, the designs and their meanings, involved in what one forlorn woman had to master in order to graduate in her art.

Dr. Washington Matthews* figures the so-called Navaho basket plaque as a drum, and says that the art of basket-making is little cultivated among them to-day, because it was neglected through the development of blanket-weaving. The material is the twigs of the aromatic sumac. The work is done in coiled weaving. The foundation is in roots of the same material, and in starting the basket the butt of the rod is placed in the center, the tip toward the periphery all the way to the end of the work. Around the middle is a band in red, and branching from this band outward and inward are triangles in black. The band is not continuous, but at one point is intersected by a narrow line of a coloured wood. At first this seemed to be an imitation of the Pueblo "line of life" on pottery, but the Navaho line is put there to assist in the orientation of the basket in the medicine lodge when the light is dim. In playing their game, the butts and tips of the Navaho give preference to the butt-end of the gambling stick, associating the idea with that of the position of the warp in the coiled basket. When the basket is finished the butt of the first twig and the tip of the last twig in the outer edge must be on a line with this radial opening. When the basket is used in ceremony this line must lie east and west. The stick for this drum is made from the leaves of the yucca bent together, wrapped, and sewed. The dull, ghostly sound accords well with the other portions of their ceremonies.

* American Anthropologist, VII, 1894, pp. 202–208.

In Preparing and Serving Food

The basket is closely connected with the Indian kitchen and dining-room, if these terms be allowed. After the purveyor has gleaned from the waters, the air, the range, or the field, with appropriate devices, and the patient carrier has emptied her baskets at the tent side, and forsooth the miller has put through their exercises quite another series, the cook and caterer take up the burden. She is generally the selfsame woman who made the baskets and performed the forenamed drudgeries. But she is prepared for this task as well. There is, first of all, the mixing bowl or basket, about the shape of the bread trays in millions of kitchens. The coiled method suits the purpose, especially in their manufacture, since to be solid and water-tight is desirable, and weight is not an objection; yet there are tribes that make excellent mixing-bowls in twined work. (See Plates 50, 53, 92, 93.)

It must not be supposed that basketry cooking-pots are placed over a fire, as might be one of metal. Great preparation and skill are necessary to success. The basket must be substantial and water-tight; the proper kinds of stones must be selected and cleaned. After heating to a high degree, they must be dipped into water to reduce the heat. A red-hot stone would spoil the broth, sure enough. Tongs of wood of a certain species, and bent just so, must be made ready, and paddles for incessant stirring.*

Plate 91 shows two of the best examples of Klikitat imbricated basketry. The foundation is seen in the basket exposed, consisting of a bundle of rude splints of cedar root; the sewing is with prepared splints of the same material, and in both figures it will be seen that no ornamentation ever occurs on the inside of this type. The method of laying on the outer ornamentation has already been explained in the earlier part of this paper.

* For illustrations of cooking with hot stones see W. H. Holmes, Report of the United States National Museum, 1900, pp. 170–173, pls. 9–15.

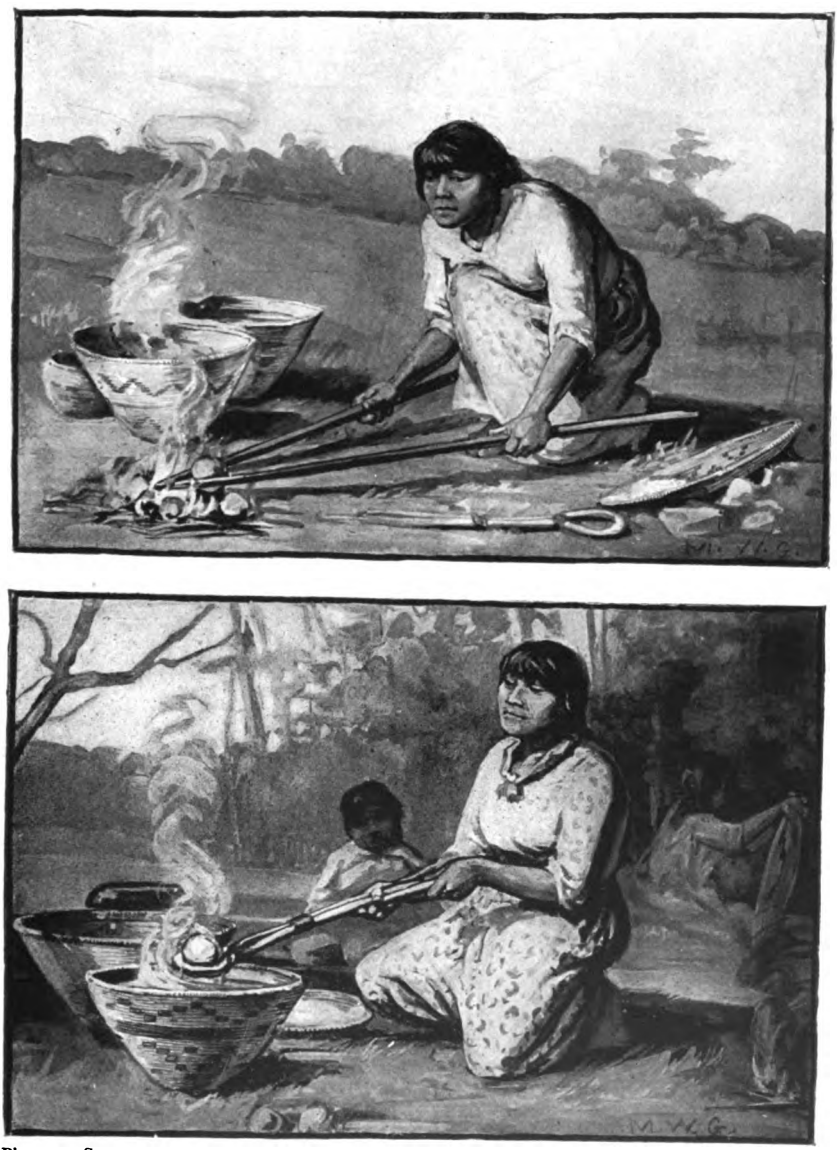


Plate 94. See page 230

MAIDU WOMAN COOKING IN BASKETS WITH HOT STONES

After William H. Holmes

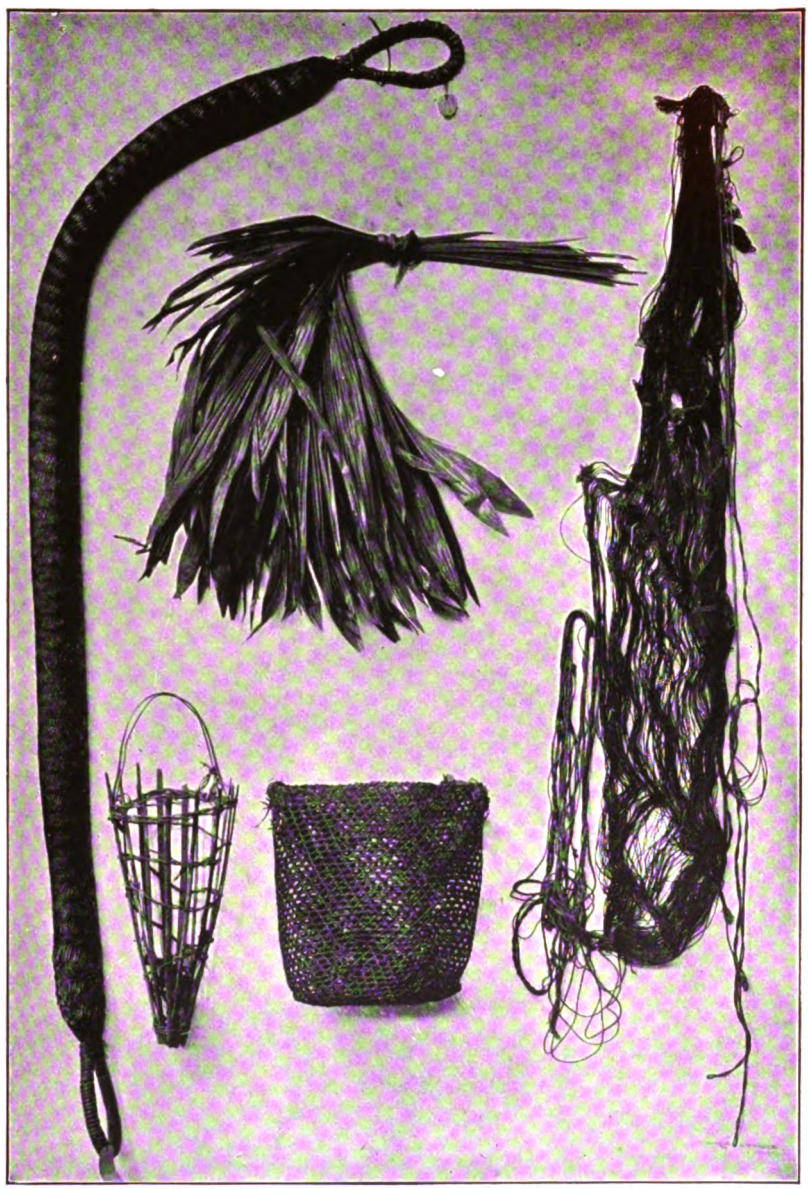


Plate 95. See page 231

BASKETWORK OF AMAZON TRIBES CONNECTED WITH PREPARING CASSAVA

Collections of U. S. National Museum

the wooden crib. There must have been something refining about this entire round of activities. In many of the baskets associated with them the ornamentation is exquisite. The hunter and the fisherman had scant encouragement to cultivate the esthetic sense in their employments; but nuts, seeds, grain, most fruits, and roots are clean. Even berries when they stain do not soil the outer part of the receptacle, so the Fraser River tribes adorn the upper portion of the baskets with beautiful patterns. The lower part is left plain. The use of baskets in the plant quest was well-nigh universal. The eastern Indians employed the cane or split ash for their wicker or twilled baskets. As far as the cane extended, even to Guiana and Brazil, this is true. The ingenious cassava strainer belongs to this class.

Plate 95 shows the domestic utensils of the upper Amazon tribes for various household purposes. Palm leaf, out of which fiber is made; the fiber itself, used in various forms of domestic utensils; baskets in two types, twined and crossed warp weaving. The cassava strainer on the left is in twined weaving, so that when the weights are taxed the bag is increased in size and the water forced out of the cassava. The specimen shown was collected for the United States National Museum by J. B. Steere.

Lewis H. Morgan writes* that in the art of basketwork, in all its varieties, the Iroquis Indian women also excel. Their baskets are made with a neatness, ingenuity, and simplicity which deserve the highest praise. Splint is the chief material, but they likewise use a species of sweet grass, and also corn husks. Among these various patterns, which are as diversified as convenience or ingenuity could suggest, the most perfectly finished is the sieve basket. It is designed for sifting corn meal, to remove the chit and coarse particles after the corn has been pounded into flour. The bottom of the basket is woven in such fine checks that it answers very

* League of the Iroquois, 1851, p. 382, showing twined baskets.

perfectly all the ends of the wire sieve. Another variety of baskets was made of corn husks and flags very closely and ingeniously braided. In their domestic economy the basket answered many purposes. Cat. Nos. 221,161–3, U.S.N.M.

From the historians of the discovery it is learned that basketry was used in connection with the gathering and preparing of food. Bartram mentions the use of a sieve which the Indians of Georgia have for straining a "cooling sort of jelly called conti, made by pounding certain roots in a mortar and adding water." Dumont describes the sieves and winnowing fans of the Indians of Louisiana. The Indian women, he says, make fine sieves with the skins which they take off the canes; they make some with larger holes, which serve as bolters, and others without holes, to be used as winnowing fans. They also make baskets very neatly fashioned, and cradles for holding maize. By comparing this statement with what is said about the California gleaners it will be seen that the Louisiana tribes knew how to sift meal, leaving the coarse particles inside the sieve, and also to separate seeds from chaff, and finally from coarse material, by beating over the edge of a tightly woven basket.

Du Pratz also says that for

> sifting the flour of their maiz, and for other uses, the natives make sieves of various finenesses of the splits of cane.

John Smith, speaking of the Indians of Virginia, says they

> use a small basket for their Temmes, then pound againe the great, and so separating by dashing their hand in the basket, receive the flowr in a platter of wood scraped to that forme with burning and shels.

Strachey makes the following statement:

> Their old wheat they firste steepe a night in hot water, and in the morning pounding yt in a morter, they use a small baskett for the boulter or seaver, and when they have syfted fourth the finest,

Plate 96. See page 234

HARVESTING AND MILLING OUTFIT FOR ACORNS, HUPAS, CALIFORNIA

Collections of U. S. National Museum

they pound againe the great, and so separating yt by dashing their hand in the baskett, receave the flower in a platter of wood, which, blending with water, etc.

There are no gleaning baskets in Arctic and few in northern Canada. Birch, elm, and pine bark usurp the place of textile materials. But all along the southern border there were gleaners and a variety of basket forms in their hands. Maize, wild rice, roots, nuts, and berries were food staples. Checker matting, wicker basketry, and twined bagging supplied the receptacles.

For the basketmaker there are four Alaskas:—Athapascan, and Eskimo, where there is no gleaning or milling; Aleutian, in which the harvest comes from the sea, and the daintiest of twined weaving is made in grass stems; and southeastern Alaska, which shall receive further notice. Storage baskets are attributed to them by early voyagers. Nowadays the ware is small, no piece exceeding half a bushel in capacity. Since seafaring is mixed with hunting and gleaning the fields, the gathering basket leads a busy life. Plates 136–149 represent the types, which, large and small, are chiefly cylindrical in shape. The methods of manufacture and decoration have been described.

In Gerstaecker's Journal is the following account of seed gatherers in California:

> While I was standing there, a couple of pretty, young girls came from the woods with flat baskets full of flower seed emitting a peculiar fragrance, which they also prepared for eating. They put some live coals among the seed, and, swinging it and throwing it together to shake the coals and the seed well and bring them to continual and close contact without burning the latter, they roasted it completely, and the mixture smelled so beautiful and refreshing that I tasted a good handful of it, and found it most excellent (p. 375).

Edwin Bryant, in his Rocky Mountain Adventures, gives this description of the acorn harvest:

We soon learned from them that they were a party engaged in gathering acorns, which to these poor Indians are what wheat and maize are to us. They showed us large quantities in their baskets under the trees. When dried and pulverized, the flour of the acorn is made into bread or mush, and is their "staff of life." It is their chief article of subsistence in this section of California. Their luxuries, such as bull beef and horse meat, they obtain by theft, or pay for in labour at exorbitant rates. The acorn of California, from the evergreen oak (*Quercus ilex*), is much larger, more oily, and less bitter than on the Atlantic side of the continent. In fruitful seasons the ground beneath the trees is covered with nuts, and the Indians have the providence, when the produce of the oak is thus plentiful, to provide against a short crop and the famine which must necessarily result to them from it by laying up a supply greater than they will consume in one year (p. 240).

The Hupa Indians, for collecting seeds, according to Professor P. E. Goddard, use the basket in the shape of a common burden basket in closely woven style.* They also made large storage baskets of close-twined work called djelo, the base being of greater diameter than the top.*

Plate 96 represents the harvesting outfit of the Hupa Indians on Hupa Reservation in northwestern California. There is the openwork twined basket for picking the seeds, the carrying basket in openwork with a decorated band at the top for bearing the crop home, the granary basket, which bears significantly on the outside the image of destructive worms that eat the crop after it is harvested. The woman's head has a pad of soft twined work on the forehead, across which the buckskin band of the carrying basket rests. The outfit of the mill consists of a large basket at the bottom for catching the acorn meal and a millstone set in this for grinding, a hopper basket, most elaborately made, resting on the rock to hold the acorns that are being ground. A similar hopper is shown below, both in its form and structure. The pestle for

* Life and Culture of the Hupa. Publications of the University of California, I, 1903, pl. XXII, fig. 2.

Plate 97. See page 235

POMO TWINED BASKETS FOR HARVESTING, MILLING, AND SERVING, CALIFORNIA

Collection of C. P. Wilcomb

grinding the acorns and the broom for sweeping up the meal complete the paraphernalia. Throughout the entire acorn area implements resembling these will be found.

The outfit for the Pomo acorn mush-maker in Mendocino County, California, is illustrated by V. K. Chesnut* in his paper on Plants Used by the Indians of Mendocino County, California (fig. 71 and Plates 13, 18), issued in 1902 by the Department of Agriculture, Washington.

It consists of eleven pieces: the picking basket for the individual gatherer; the holding basket for receiving the contents of number one; the cone-shaped carrying basket, with headband; the granary basket at the home, holding two or more bushels—many of them have beautiful covers; the basket hopper, open at the bottom to fit on the mortar stone—the work of strengthening these taxes the ingenuity of the weaver; the mat for the meal, to be placed under the millstone; the sifting plaques, in openwork, for coarse separating, and tightly woven, for shaking the waste over the edge; the cooking pot of the closest weaving; the dipper; the eating bowls; and the daintily woven basket hat.

William H. Holmes illustrates at length the acorn harvesting and milling industry in northern California, carrying and hulling the nuts, pounding them in stone mortars, grinding the meal, separating the coarse particles, cleaning the meal by shaking and blowing, leaching in sand and using hot stones for cooking in basket pots.†

Plate 97 is a group of baskets in plain-twined weaving (Bamtush) in the collection of C. P. Wilcomb, of San Francisco. It consists of a conical carrying basket, mill hopper, granary basket, and mush bowl. The carrying basket is in plain-twined work throughout. Even the narrow bands near the top are no exception, for though each twist in the twine

* Contributions to the National Herbarium, VII, pp. 295-408.

† Report of the United States National Museum, 1900, pls. 10–15 and 22.

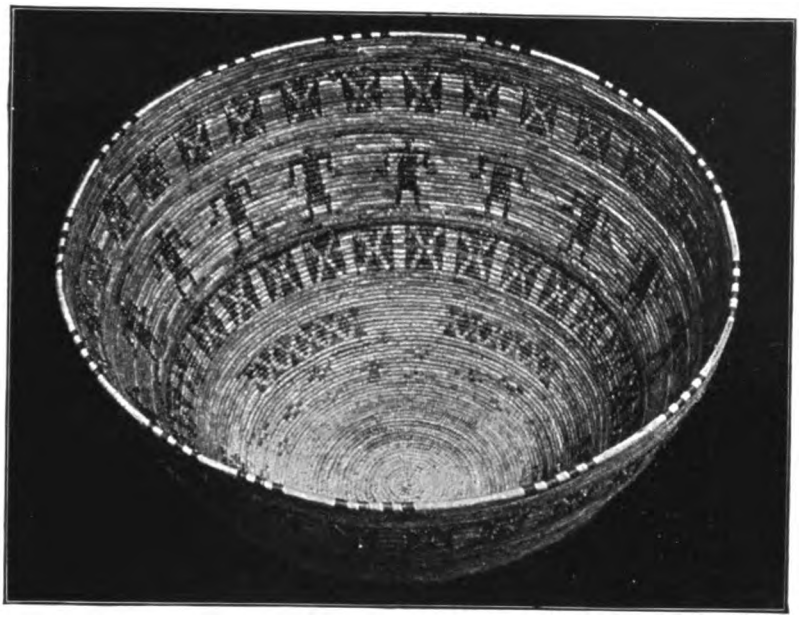
passes over two warp stems, on the next round the same two are included in the twist above. Casting the eye upward will show that in the upper band next to the border the same motive occurs, but the same pairs of stems are not inclosed in the twist. The effect of this ornament is quite pleasing, as the two bands with intervening space form an endless zigzag pattern. The border of this basket is formed by bending the warp stems down as the foundation of a coiled work, which is strengthened by a hoop of wood. The bands of ornamentation on this and the other baskets in this group are explained under "Symbolism."

The mill hopper is also in plain-twined weaving, strengthened with three narrow bands of tee weaving. The granary basket and the mush bowl are noteworthy, especially on account of the peculiar method of finishing the work by merely cutting off the warp stems.

Plate 98 represents two specimens in the collection of C. P. Wilcomb, both of them from Tulare County, California. The upper figure is a bowl connected with the body in twined weaving. The diameter is 14⅝ inches. The ornamentation is in four bands, the lower broken, the second in chevron pattern, the third human figures, the fourth the standard hourglass pattern. On the margin are spots in black material in groups of fours. The lower figure represents a typical mortar, stone with pestle and hopper, in this case glued to the upper surface of the millstone. The ornamentation on the upper is also the standard band of hexagonal figures. A similar mortar dug up by C. J. Dyer, is in the collection of W. J. Walz, El Paso, Texas.

Gleaning and milling of wokas, seed of the waterlily (*Nymphaea polysepala*) and their relation to basketwork among the Klamath (Lutuamian F.) in southern Oregon are fully illustrated by Coville,* three of whose plates are here repro-

* Coville, F. V., Report of United States National Museum for 1902, pp. 725–739, pls. 7, 11, 13.



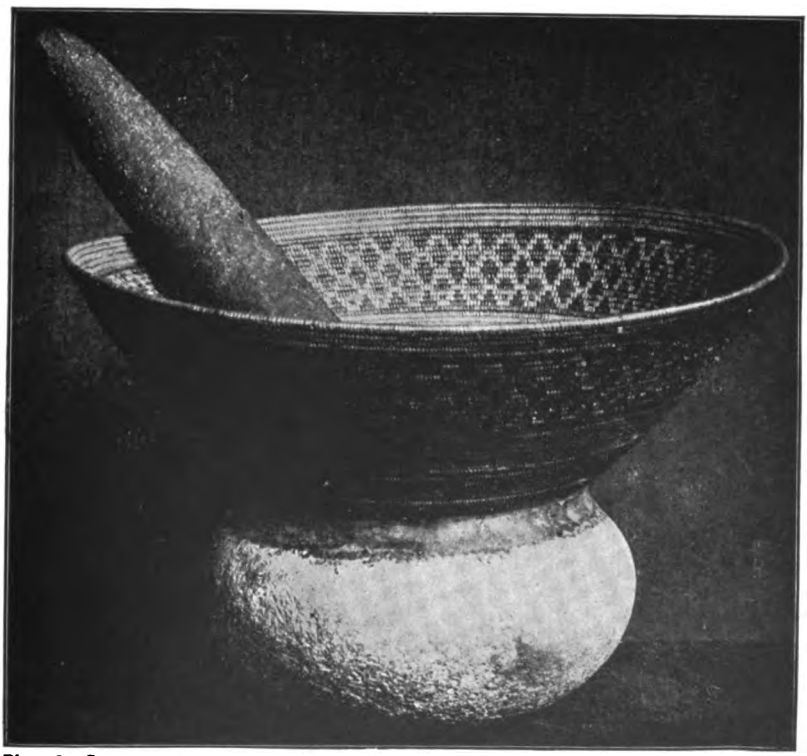


Plate 98. See page 236

YOKUT MUSH BOWL AND COMPLETE MILL, TULARE COUNTY, CALIFORNIA

Collection of C. P. Wilcomb

Plate 99. See page 237 KLAMATH INDIAN OUTFIT FOR GATHERING SEEDS OF THE WOKAS, A WATER-LILY, SOUTHERN OREGON

After Frederick V. Coville

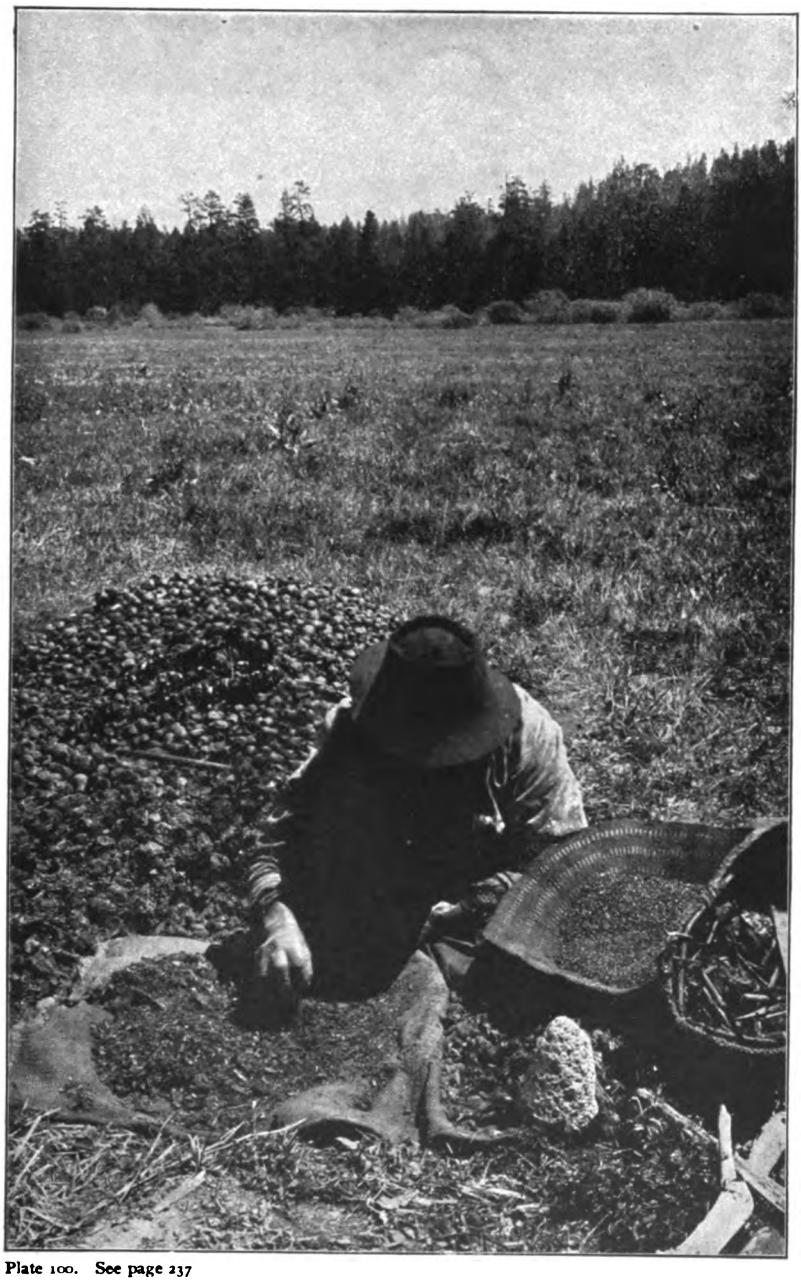


Plate 100. See page 237

KLAMATH INDIAN EXTRACTING WOKAS SEEDS FROM THE PODS, SOUTHERN OREGON

After Frederick V. Coville

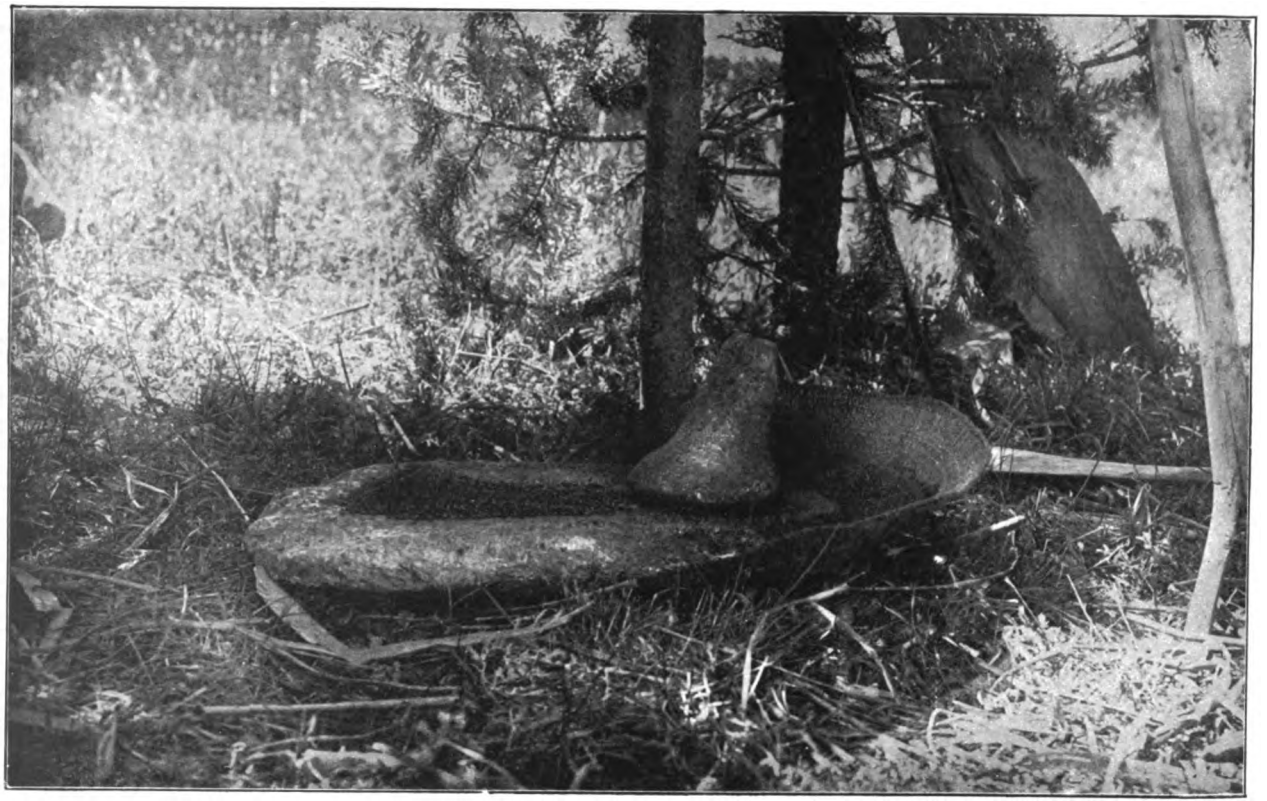


Plate 101. See page 237 KLAMATH INDIAN OUTFIT FOR GRINDING WOKAS SEEDS, SOUTHERN OREGON

After Frederick V. Coville

duced (Plates 99–101). In the former will be seen the lily-giving waters, the rude canoe of the women, mats in twined weaving for drying roots, and the ubiquitous sack, the receptacle of commerce. Plate 100 associates basketry with the separating process, first and rudest in the line of cleaning mills. The slab or metate and the rubbing stone or muller rests upon a large shallow basket. The stones and the basket, with the woman's strong arms, make up the whole apparatus in what by-and-by will be a roller mill. (See Plate 101.)

Speaking of the Apache Indians and others farther south, Captain John G. Bourke mentions their fanning trays for cleaning the seeds of grasses. Hot stones are placed in them, with the coarse material, and the chaff is burned out. The Captain also mentions that the trays are wetted to keep them from burning. This cannot be a universal practice, because in some of the Ute specimens in the Museum the texture is very much charred.

Hough says that the long and pointed gathering basket of the Havasupai is tied to the belt in front by the woman when gathering mesquite beans, etc. The pointed bottom passes between the legs while the squaw walks around gathering. At the camp the basket is set in a frame. The baskets are made in the spring, when the sap is running.

Plate 102 shows the most primitive form of storage, holding several bushels, used by the Mohave Indians in the desert between Mexico and southern Arizona. It resembles more a bird's nest than a textile preparation. The specimen is in the Field Columbian Museum, Chicago, and to the courtesy of C. L. Owen and G. C. Simms I am indebted for the photograph.

The Mohave and other tribes have curious granaries for storing mesquite beans, corn, etc., near their houses. A platform is constructed on high poles; upon this is placed a round, bottomless basket from 3 to 5 feet in diameter and 2 to 3 feet deep. These are made of arrow-weed stalks tightly interwoven. When filled, the top is sealed with mud to keep out

rain. In specimens examined by Owen and Simms, of the Field Columbian Museum, several of these nest-like baskets were clustered on the same platform and a rude fence served for inclosure.*

In House Building and Furniture

House and furniture were here and there constructed of basketwork, so the basketmaker became architect and cabinet-maker. Of the former, the wall may have been constructed like a huge, coarse basket, with upright stakes for warp and brush, canes, rushes, or leaves of palm for weft. The roof, also, especially in its framework, was in some tribes an immense shallow basket bottom inverted. The rafters were the parallel or radiating warp and the interlacing vines the openwork woof into which many kinds of thatch were fitted.

Accessory to the house, whether a woven structure or not, were fences, awnings, screens, and shelters. They were woven after the fashion of the walls. In middle America and the tropical portions of South America, but far more skilfully in the Philippine Islands and all about the Indo-Pacific, the mat and light basketry serve for seclusion and decoration among the houses. Open checkerwork, twilled weaving, wattling, or twined textile are as effective as they are light and easily put together. When they were moving about, or in situations where a compact dwelling wou'd have been burdensome, it was an affair of only a few moments to imitate the nest-building birds and throw together a wickiup or leaf shelter of some kind.

The winter houses of the Pomo Indians were a rude kind of feathered basketry. They are described by Carl Purdy† as domes of wickerwork, thatched heavi'y with grass or tule (page 443, with illustration). The summer houses were of

* For illustration see Newton H. Chittenden, Land of Sunshine, 1901, p. 202.

† Land of Sunshine, XV, May, 1901.

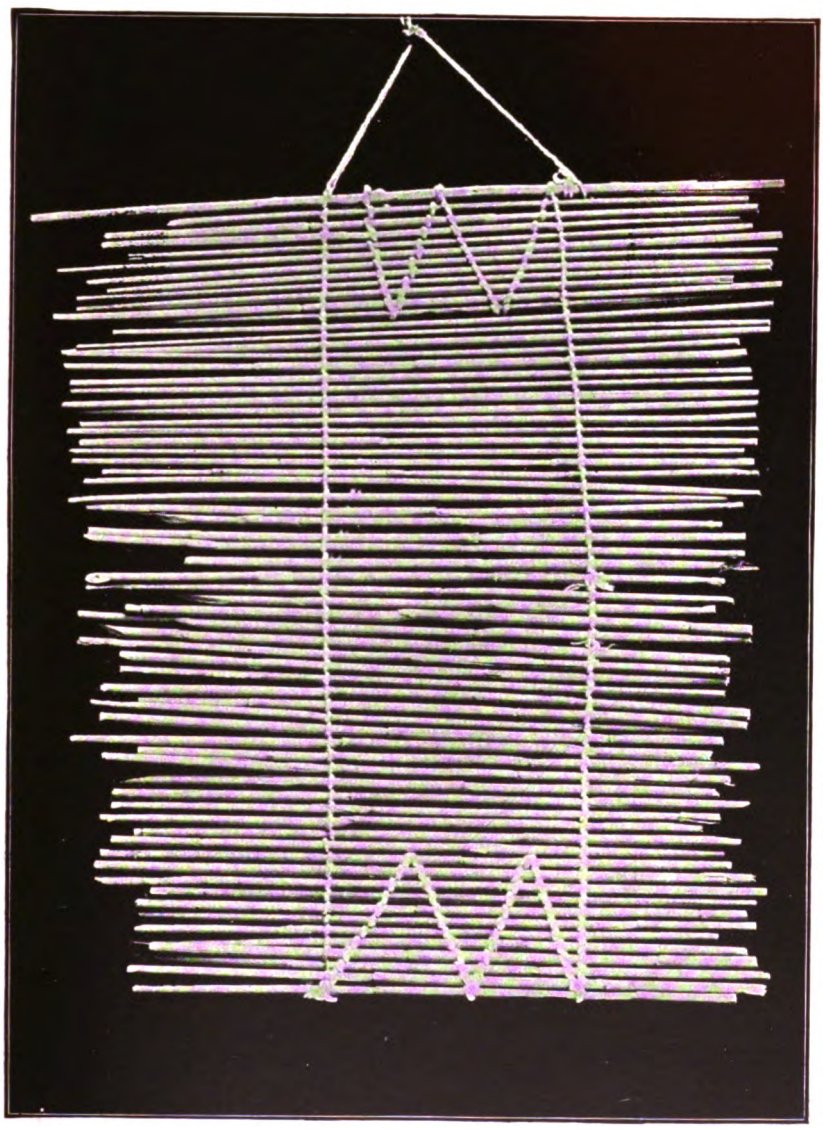


Plate 103. See page 239

HOPI BASKETRY CASE FOR HOLDING THE BRIDAL COSTUME, N. E. ARIZONA

Collections of U. S. National Museum

wickerwork covered with boughs, and the tribe moved several times a year as acorns, fish, game, or dry quarters were desirable. They solved the problems of transportation by moving themselves about.

Furniture had not the pretentious meaning that it possesses in civilisation. The bed for the Indians was the most desirable luxury. Their chairs were mats of many styles of weaving and many colours. All of them were plicated by hand and were the production of the basketmaker.

But the bed was not always a basket. In the North it was the warmest furs and robes; in many tribes the mat took the place of the robe, and over a wide area the hammock was chair by day and bed at night. In some of these the twine is knotted or netted and the hammock is in no sense a basket. Throughout the Southwest a resting device is formed by the very ancient basketmakers' process of stringing a number of stiff rods together by three or more rows of weaving. (For a Hopi bridal costume case see Plate 103.)

In Mortuary Customs

The basket is intimately associated with Indian life in the "last act." Not only fabrics woven in basketry technic were wrapped about the dead and used to protect the body, but on the sentimental side examples of the finest workmanship were either deposited or burned with their makers. Plate 104 is taken from Pepper's account of the basket-making Indians of Utah, and is interesting as exhibiting the method of burial among the ancient tribes of southeastern Utah in the canyon country. These old people must have lived long in these curious retreats, for on top of their graves are found deposits made by later tribes. The corpse was placed in the hollow of a rock and covered with a rabbit-skin robe made in twined weaving. On top of all was turned upside down a coiled basket. The plate shows the method of administering the blanket and the basket, and the lower figure of the plate declares the type and

style of weaving used by these ancient basketmakers. The foundation is of three-rod type. The four figures on the surface near the margin are like the butterfly design seen on some modern ware, but the symbol is not known. Horatio N. Rust tells of a young Indian girl who was dying of consumption. She wore on her person a small basket of beautiful workmanship, and gave it to a young American, begging him to have her buried in a coffin and the little basket placed within.

Another Indian, Roherio by name, living in the southern California country, tells of his wife, who, when dying, called him to her and said: "Take my basket cap, which I have always worn since I have been your wife, and burn it, with everything that is mine." He obeyed her, and burned two trunkfuls of personal property.

Clarence King describes vividly, in his Mountaineering in the Sierra Nevadas, a cremation scene:

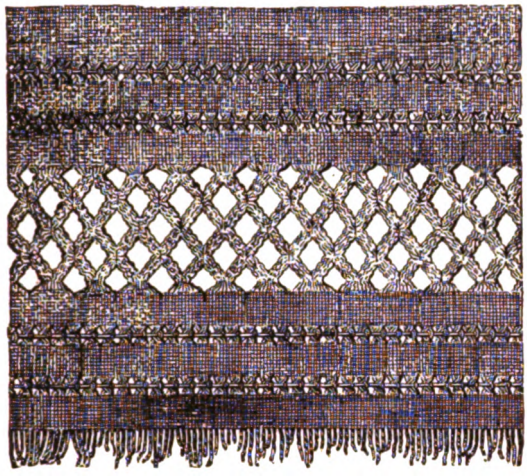
> In the opening between the line of huts a low pile of dry logs had been carefully laid, upon which, outstretched and wrapped in her blanket, lay the dead form of "Sally," the old basketmaker, her face covered in careful folds. Upon her heart were the grass-woven water bowl and her latest papoose basket. The flames slowly lapped over, consuming the blanket, and caught the willow papoose basket. When the husband saw this the tears streamed from his eyes; he lifted his hands eloquently, looking up at the sky and uttering heartbroken sobs. All of the Indians intoned in pathetic measure, "Himalaya, Himalaya," looking first at the mound of fire and then out upon the fading sunset.

The desert region of Peru was favourable to the preservation of delicate textiles, and it is in the cemeteries of this region that large quantities of basketry in every style of weaving here described have been found.* (For lace work see Plate 105.)

In Relation to the Potter's Art

Pottery and basketry were in America, especially among the savage tribes, both the work of women. Before answering

* For basketry (coiled and twined) from graves in Peru, see Eleventh Annual Report of the Peabody Museum, pp. 280–292.



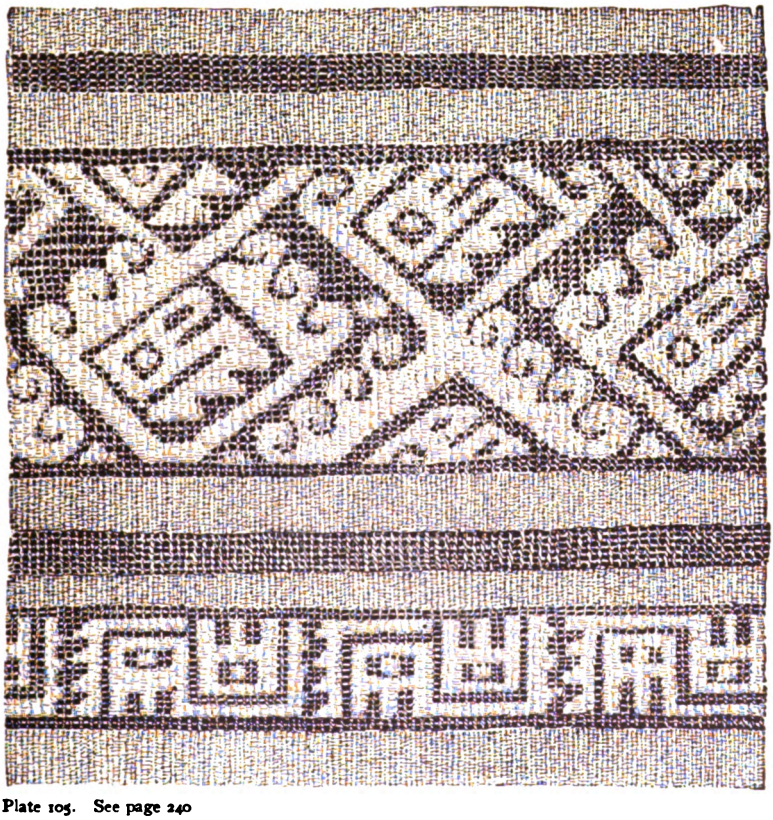


Plate 105. See page 240

ANCIENT PERUVIAN LACEWORK

After W. H. Holmes

the question how far one art was useful to the other, attention must be called to the fact that in eastern United States both prevailed almost universally. In the Arctic, excepting the rude pottery of Alaska on Bering Sea, and on the Pacific from Mount St. Elias to Santa Barbara Islands, the tribes made only basketry. Those of the interior basin and all southward were expert in both.

It was formerly believed that in the eastern division of the United States, especially, pottery was made to a large extent in basketry. Eminent students held this opinion, and there seemed to be abundant evidence of its truth. Cushing figures a basket with clay inside to protect the former in the cooking of seeds and grains.*

Holmes now believes that the extent to which good baskets were used for modeling pottery in this province has been greatly overestimated. There are innumerable examples of basketry and other textile markings on earthenware, and he divides them into five classes:

1. Impressions from the surface of rigid textile forms.
2. Impressions from cloth and nets.
3. From woven textures used over the hand or modelling implement.
4. From cords wrapped about modelling paddles or rocking tools.
5. Impressions of bits of cords or other textile units, singly or in groups, applied for ornament only, and so arranged as to produce textile-like patterns.

In modelling a clay vessel, a basket might be used as a support and pivot. It might assist in shaping the bodies of vessels, assuming to a limited extent the limits of a mould. Also, the mat upon which a plastic form rests will leave impressions that firing will render indelible. The tribes of the Pima

* William H. Holmes: American Anthropologist (N. S.), III, pp. 397–403; also F. H. Cushing, Fourth Annual Report of the Bureau of Ethnology, 1886, pp. 483–493.

linguistic family produce jars and baskets of the same shape; but if a row of Zuñi or Hopi pottery be compared with a row of their basketry, they would not suggest that either one was the predecessor and occasion of the other. Laying aside the inquiry whether the basket was the progenitor of the pot, inasmuch as the same hands often produced both, the former unwittingly rendered itself immortal by its many little helpful attentions to the latter in its formative stage. The pot was afterward fired and worn out and broken into fragments that were buried out of sight. In these last years the archeologist exhumes the shards, washes them carefully, and makes casts of their surfaces in plaster or artist's clay. A glance shows that, though the surfaces of the shards are much worn away by time, the lines in the little cavities are as sharp as when the clay and the basket made each other's acquaintance centuries ago (see Plates 106, 107).

In the shards examined by Eggers and Holmes one fact is preserved that no historian recounts, namely, that twined basketry as varied and beautiful as that of the Aleutian Islanders was made by the tribes in the Mississippi Valley before the fifteenth century.

As a Receptacle

Very few of the Indian tribes of America were so unsettled in life as to be without a home. About such a place accumulated personal property and provisions for the future, large and small. On the Great Plains of the West, receptacles were made of rawhide gaudily painted. On the MacKenzie drainage, bark of the white birch was the material, decorated with quills of the porcupine dyed in many colours. But for holding the bone awl and the sinew thread, the trinkets belonging to dress, the outfits of fisherman and hunter, the baskets and the wallet were well-nigh universal. In the industries and other activities of life in which materials, utensils, apparatus, in a word, things were involved, there were receptacles for holding them. The

Plate 106. See page 242

RELATIONSHIP BETWEEN BASKETRY AND POTTERY

After F. H. Cushing

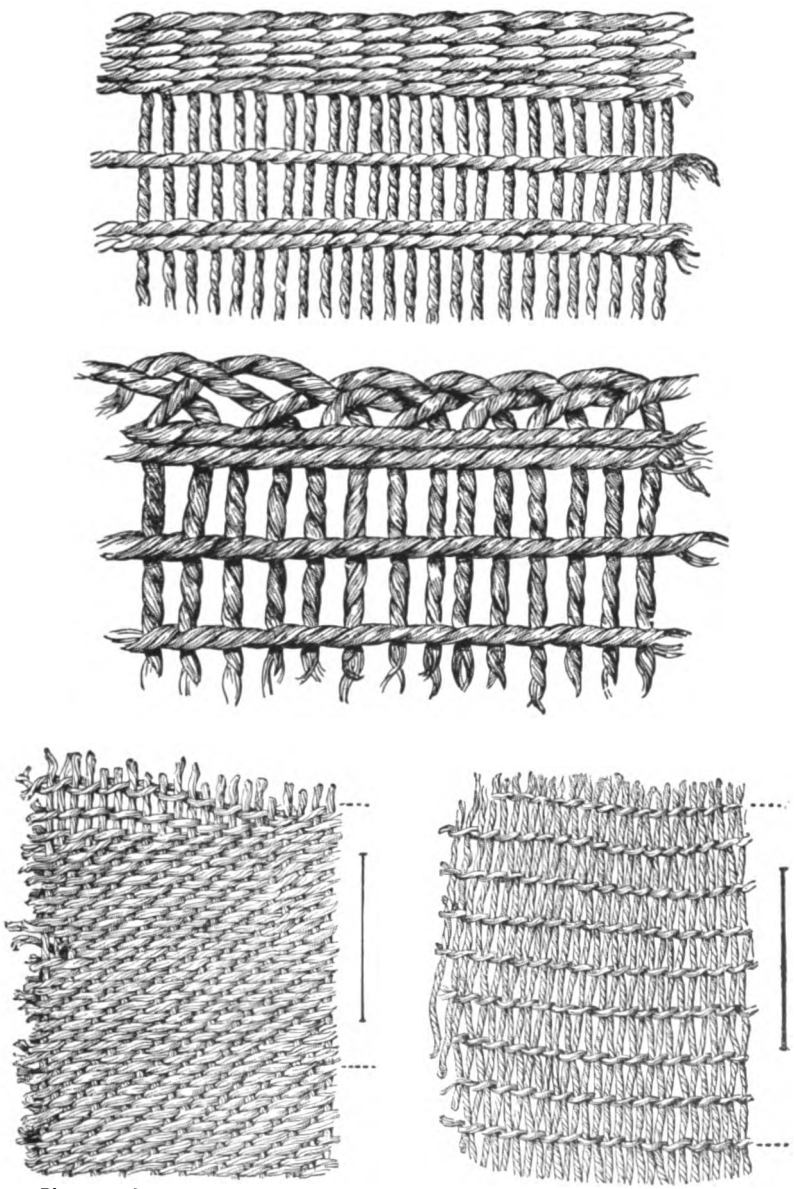


Plate 107. **See page 242**

TWINED BASKETRY TECHNIC PRESERVED BY POTTERY

After W. H. Holmes

Tunnit Twisted Ammunition Holder

Adaptation of loom to Rio-Sio demands; the weaving and patterns are aboriginal

Collected by Jacob G. Swan

is Catalogue No. 1,156 in the United States National Museum, and was collected by James G. Swan.

Plate 109 represents a woman's work-basket of the Tlinkit Indians, of southeastern Alaska, in twined weaving, ornamented in false embroidery. Doubtless the form is derived from Russian motives, but it is extremely common among the Indians in this locality and is useful in a thousand ways for holding material. This specimen was collected in Sitka, Alaska, by J. J. McLean.

The Fraser River tribes in British Columbia illustrate also what is said about the power of suggestion in modifying form, and even structure, in an art. The bulk of their stalwart baskets are made for cooking and harvesting apparatus. But where the Hudson Bay Company's and Malayo-Pacific packages came into view, another class of baskets appeared, fashioned in their shapes and ornamented over their entire surfaces (see Plates 43 and 44)

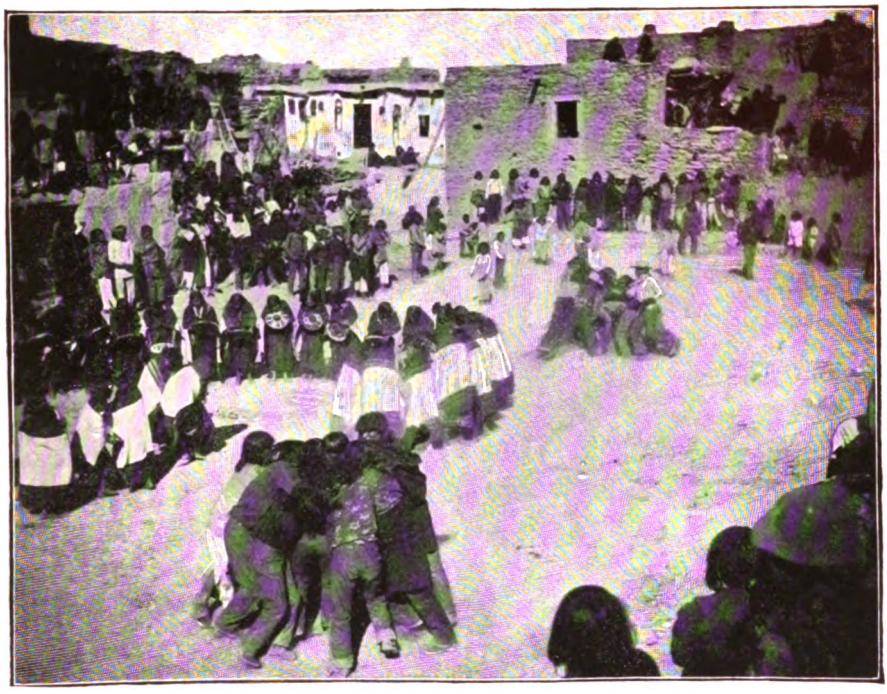
In Religion

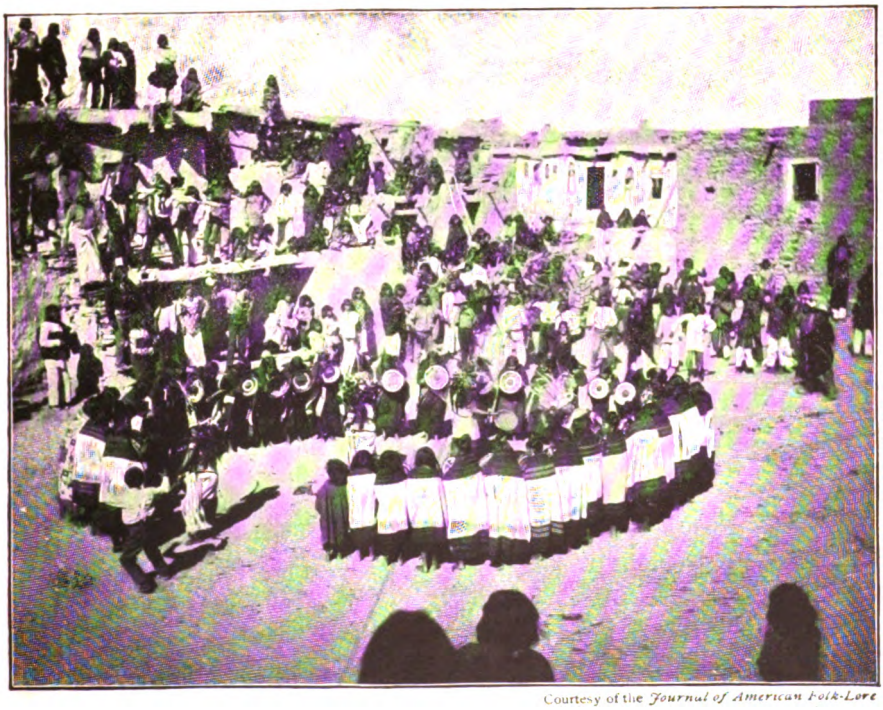
The one who carried the sacred basket in the Greek religious processions was called the Kanephoros, and it will be remembered that in the consecration of Aaron and his family to the priesthood, among the multitude of paraphernalia was the basket of shew bread.*

In one tribe, at least, of American aborigines—the Hopi of northeastern Arizona—bread consecrated to the service of religion is set before the altar in beautiful plaques of coiled and wicker basketry, on which the emblems of religion are wrought in colours.

By religion is meant beliefs about a spirit world, with all its inhabitants and their relations with mankind; this is creed, and cult, or worship. "The best for the gods" is the talisman in the rudest faiths as in the highest. So it will be found that basketry devoted to religion is worthy of its object.

* Leviticus, viii, 2.





Courtesy of the *Journal of American Folk-Lore*

Plate 110 See page 240.

BASKETS IN HOPI CEREMONY

After J. Walter Fewkes

Plate III. See page 247

BASKETS USED IN HUPA WOODPECKER DANCE, CALIFORNIA

Photographed by A. W. Ericson

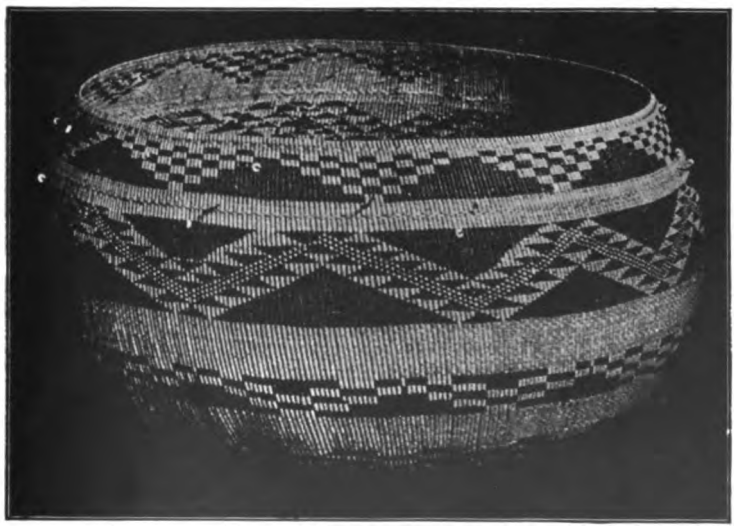


Plate 112. See page 247

GIFT, AND ALSO WEDDING BASKETS OF THE POMO INDIANS, CALIFORNIA

Collection of C. P. Wilcomb

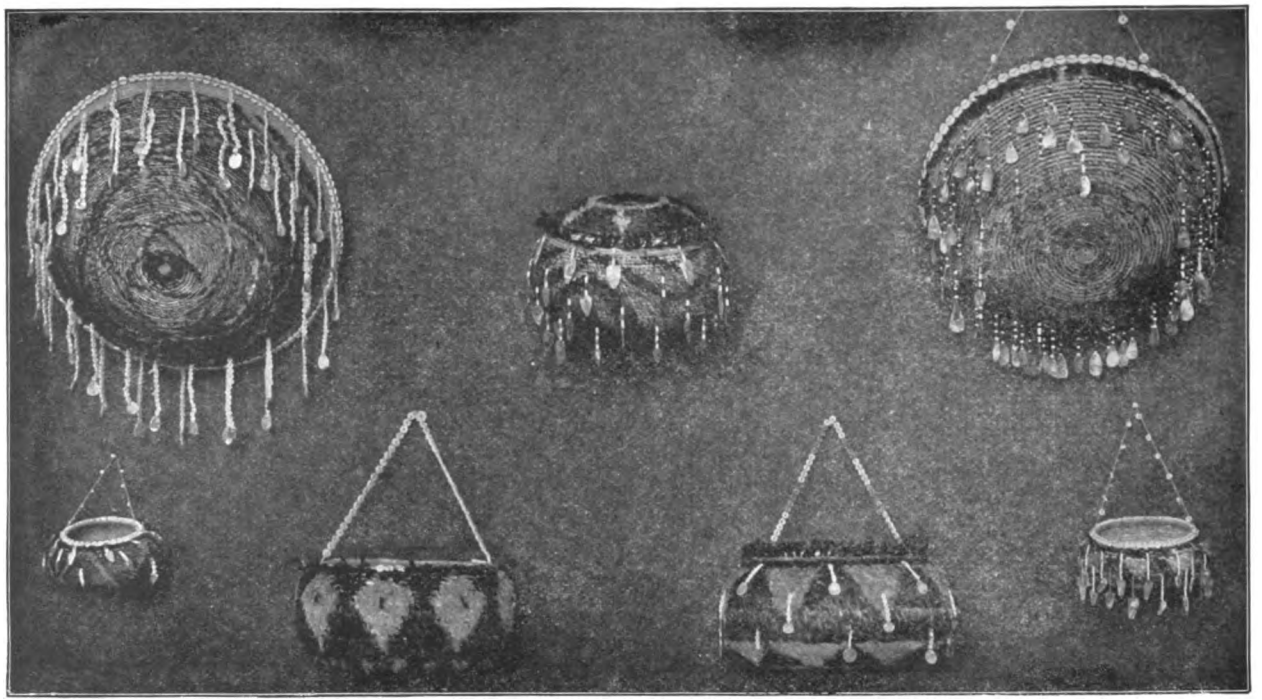


Plate 113. See page 247

POMO WEDDING OR JEWEL BASKETS, ADORNED WITH FEATHERS AND SHELLS, CALIFORNIA

Collection of C. P. Wilcomb

In the autumn, during the months of September and October, the Hopi Indians of northeastern Arizona celebrate their basket dances. They have been studied by J. Walter Fewkes and J. G. Owen. The basket dance is a public exhibition, closing a series of secret rites, the whole festival being called *Lalakonti*. It is rather a posturing of the body in rhythm, together with songs, during which baskets are carried by women or thrown as gifts among the assembled spectators.

Those taking part in these dances are in two groups—the basket bearers, or chorus, and the basket throwers, or *Lakone manas*. The only man participating is a priest called the *Lakone taka*.

The costumes of the participants, the method of holding and throwing the baskets, and the struggles of the men for the specimens, are all carefully described by Dr. Fewkes.*

In archeological studies at the Chevlon ruins, about fifteen miles east of Winslow, Arizona, a large amount of basketry was found in the graves. Much of it had the form of plaques like those still used in Oraibi and the Middle Mesa. The inhabitants of the old pueblos at Chaves Pass were also clever basket-makers, and had the same beliefs as their descendants concerning the kinship and close relationships of life between spirit beings and men.

With reference to these basket dances, Dr. Hough says the baskets used are shallow, circular trays, either coiled or wicker, invariably of Hopi manufacture, and all decorated in colours. The designs on the *Lalakonti* baskets are various, and there seems to be a greater use of symbolic figures than in those specimens commonly offered for sale. In some examples the designs are conventionalised merely to the extent of adapting them to the field of the basket and the exigencies of the weaving. In most cases, however, the design is in the last stages of convention and the original motive is lost.

* J. Walter Fewkes, Journal of American Folk-Lore, XII, 1899, pp. 81 to 96.

Plate 110 shows the portion of the Hopi *Lalakonti* ceremony in which occur the dance of basket bearers and the struggle for baskets.

The uses of baskets of the plaque type by the Moki may throw light on the reason for their occurrence in the "basket dances." In the household these plaques are devoted to various purposes; ground meal is heaped upon them in high cones by the grinders, or dry food, such as piki bread or dried peaches, is served in them. A basket being difficult and laborious of construction, and high-priced, besides being easily soiled and unsuitable for the uses to which pottery is put, is

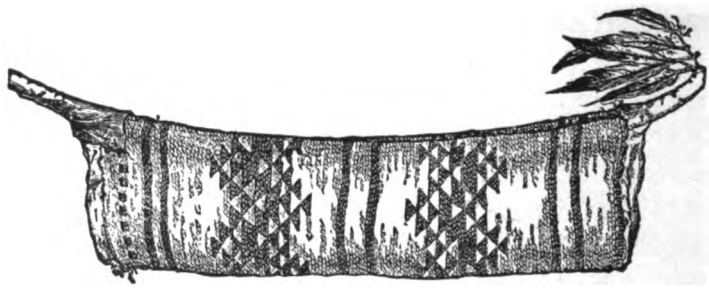


FIG. 109.
CEREMONIAL BASKET.
Hupa Indians, California.
Collected by P. H. Ray.

employed in cases of nicety, or, one might say, of luxury. Whenever presents are exchanged, it is proper to carry them on basket trays.

Baskets form an important part of the paraphernalia of the religious fraternities, being used to at least as great an extent as pottery for containing sacred meal, the prayer-stick, offerings, etc. Usually, new plaques are prepared for sacred use upon the altars and in the service of the fraternities, notably the *Lalakonti*. It may be found that plaques are almost entirely of ceremonial import.

Sometimes baskets are placed on the walls of rooms as a decoration. This was observed at Sichomovi, where a frieze

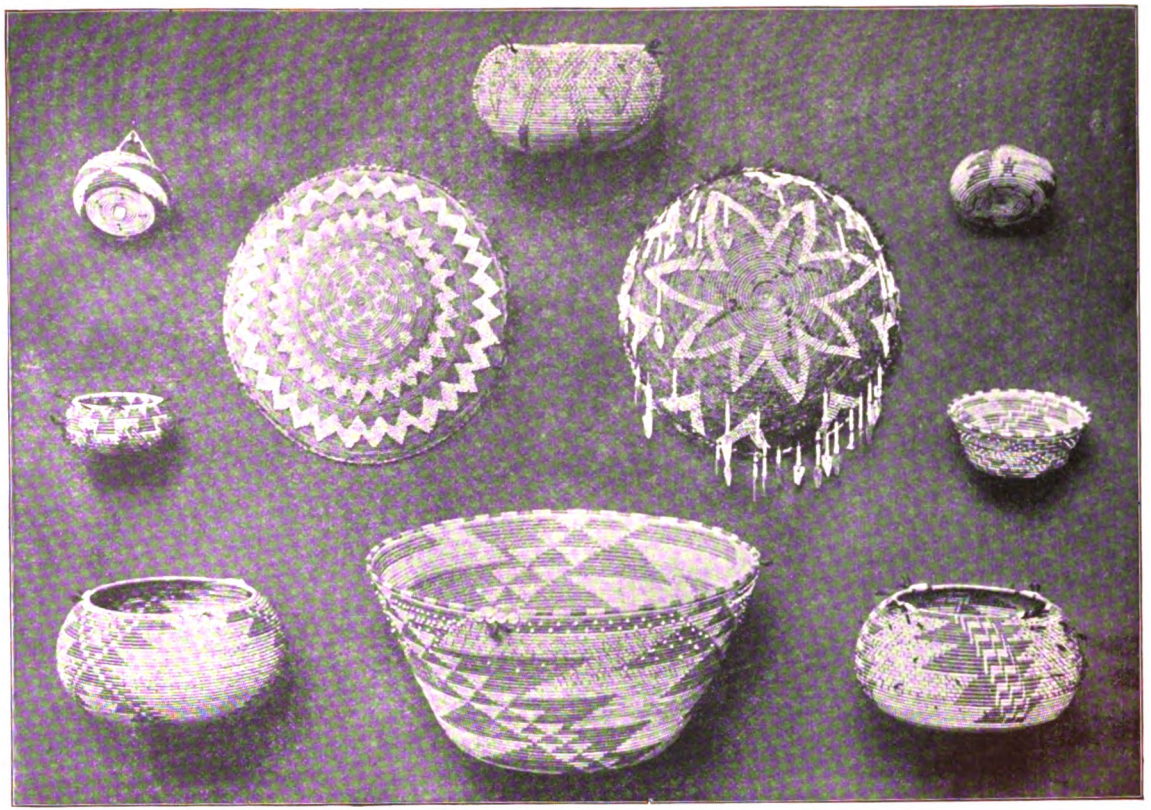


Plate 114. See page 247

POMO WEDDING OR JEWEL BASKETS, ADORNED WITH SHELL BEADS AND MONEY, CALIFORNIA

Collection of C. P. Wilcomb

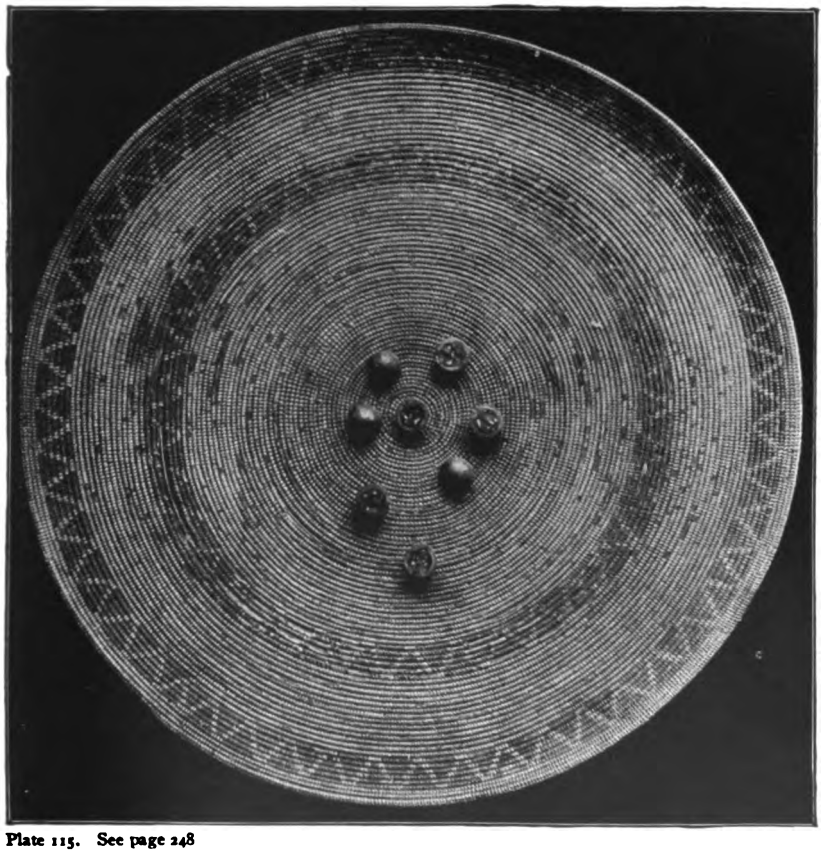


Plate 115. See page 248

YOKUT GAMBLING MAT, WITH DICE MADE OF WALNUTS, TULARE CO., CAL.

Collections of U. S. National Museum

of Coconino baskets decorated a room in the house of Wa lu tha ma.

The use of baskets in religious ceremonies by the Navaho Indians is described in Dr. Matthews's paper, The Mountain Chant, a Navaho Ceremony. (See page 516.) Among the Yaquis of northern Mexico baskets are used for holding palms, which they use in their sacred ceremonies. The Hupa Indians, on the Hupa Reservation, in one of their dances hold in their hands baskets, examples of which were collected by Captain Ray, of the United States Army, and illustrated in the Smithsonian Report for 1886, Plate XI, fig. 45 (see fig. 109).

Professor P. E. Goddard* describes the use of this basket in the ceremony (see Plate III from a photograph by A. W. Ericson).

In Social Life

Baskets played a rôle in the etiquette of the Indians. The Choctaws, in sending a gift of fruit, use a heart-shaped basket to convey a sentiment of sincerity. (See Plate 134.) The wedding basket of the Pomos is an exquisite production in twined-weaving. During a marriage festivity the bride's mother presents her son-in-law with a large, handsome basket, which he must immediately fill with cakes and pine sugar for the guests. It is thereafter known as chi-mó pi-ká, or dowry. On such occasions the artist is incited by a combination of powerful motives to do her best. Among the same Indians the gift basket, presented by the maker as a token of friendship, is a masterpiece not only in fineness, but in the exquisite sentiments of its design. In the National Museum are good examples both of the wedding and of the gift baskets. (See Plates 112–114.)

The Gualala style of gambling, says Powers, prevails all over the State, but the Tulare have another sort, which pertains exclusively to the women. It is a kind of dice throwing, and is called *U-chu-us*. For a die they take half of a large acorn,

* See Life and Culture of the Hupa, University of California, 1903.

or walnut shell, fill it level with pitch and pounded charcoal, and inlay it with bits of bright-coloured abalone shells. For a dice-table they weave a very large, fine basket-tray, almost flat, and ornamented with devices woven in black or brown, mostly rude imitations of trees and geometrical figures. Four squaws sit around it to play, and a fifth keeps tally with fifteen sticks. There are eight dice, and they scoop them up with their hands and dash them into the basket, counting one when two or five flat surfaces turn up. (See Plates 115, 116.)

The rapidity with which the game goes forward is wonderful, and the players seem totally oblivious to all things in the world besides. After each throw that a player makes, she exclaims *yet-ni* (equivalent to "one-y"), or *wi-a-tak*, or *ko-mai-eh*, which are simply a kind of sing-song or chanting. One old squaw, with scarcely a tooth in her head, one eye gone, her face all withered, but with a lower jaw as of iron, and features denoting extraordinary strength of will—a reckless old gambler, and evidently a teacher of the others—after each throw would grab into the basket and jerk her hand across it, as if by the motion of the air to turn the dice over before they settled, and ejaculate *wi-a-tak*. It was amusing to see the savage energy with which this fierce old hag carried on the game. The others were modest and spoke in low tones, but she seemed to be unaware of the existence of anybody around her.*

The plates show two varieties of the Yokut gambling trays—the flat and the dished. The former is in the National Museum, collected by W. H. Holmes; the latter is in the C. P. Wilcomb collection, collected on the Tule River.

In Trapping

One of the earliest and most primitive uses of basketry textile was in connection with the capture of animals. In a paper on traps, published by the Smithsonian Institution,†

* Contributions to North American Ethnology, III, 1877, pp. 377, 378.

† Report of the Smithsonian Institution, 1901, pp. 461–473.

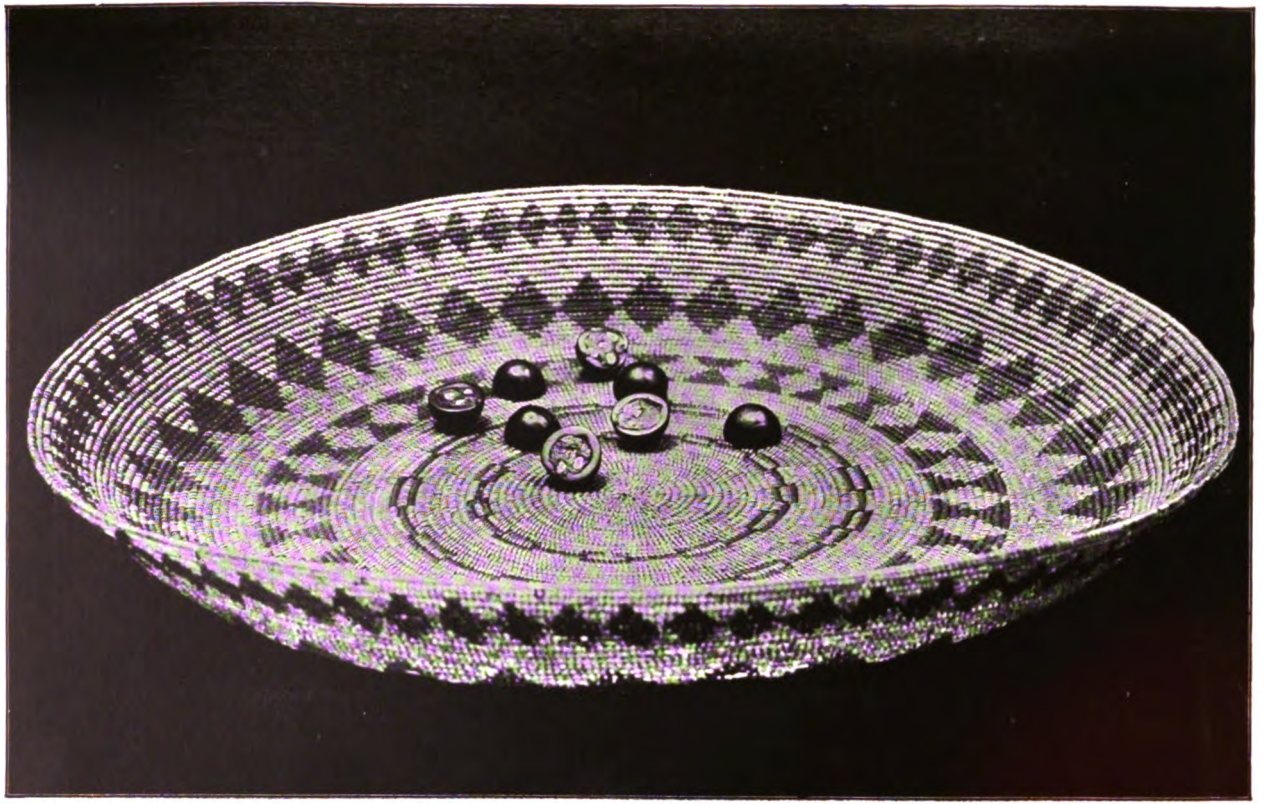


Plate 116. See page 248

GAMBLING MAT AND DICE FROM TULARE COUNTY, CALIFORNIA

Collection of C. P. Wilcomb

the word *trap* is defined as "an invention for inducing animals to commit self-incarceration, self-arrest, or suicide." The basketry traps are used principally for penning or impounding animals, and not for killing them. In every one of the areas mentioned, coarse wickerwork or twined weaving are used in this function, and there is little doubt that many of the very finest processes of weaving by hand were derived originally from coarse work of this character.

The Pomo Indians make a trap for catching fish from *Juncus effusus*. The interesting feature about these objects is that they are a gross production in brush of the rare Mohave carrying basket, in which the weft is wrapped once about each warp element in passing.

In Carrying Water

Nearly everywhere throughout the Western Hemisphere the Indian was encamped near springs of water, and in his journeys about, for hunting and other purposes, knew always where to obtain it. An exception to this is the arid region of the western portion of the United States.

Among the Shoshonean tribes, and in the pueblos, seeking out, carrying, and storing water were the chief industries, and most of the religious ceremonies and prayers were with reference to rain.

The canteen and the larger carrying jar among the sedentary tribes was of pottery, but with the Utes, Apaches, and other unsettled tribes these vessels were of water-tight basketry, made with round or conical bottom, so that in settling on a level the center of gravity would bring the vessel into an upright position and thereby keep the water from spilling. (Plates 32, 33.)

The transportation and storage of drinking water is one of the functions of pottery. Aquarius, the water-bearer of the sky, is represented with a jar in his hands, and the spirits that haunt the springs in classic mythology are all of them friends

of the potter. The Indians of the Atlantic area were well supplied with water and had vessels of clay. The Eskimo made bottles of sealskin; so did the tribes of the Pacific coast, as far south as the Columbia. But in the Interior Basin of the United States, Indians of the Shoshonean, Athapascan, and Yuman families substitute basketry for pottery in their canteens, jugs, pitchers, and small tanks. These are made in coiled or twined ware, and sealed with pine tar in the north and asphaltum in the south. It is probably owing to the unsettled life of these tribes that they out and out invented this ingenious substitute for fictile ware. There is no lack of clay, for pueblos in the midst of the region are the last strongholds of Keramos in America. And there was in prehistoric times no lack of pottery here, as the supply of charming whole pieces and precious fragments bears witness.

The most interesting connection of hydrotechny with basketry was discovered in a cliff-dwelling three miles north of White River Agency, on the White Mountain Apache Reservation, Arizona, by Charles L. Owen, of the Field Columbian Museum, Chicago. Baskets, without bottoms, were built on the floor of the cavern. The warp was of willow shoots with the leaves on. The weft was in juniper and willow twigs, in twined weaving or wattling. The interstices were filled with puddled clay, to make them useful receptacles for water, which had to be transported from the canyon 300 feet below. An example brought away, No. 68,876, in the Field Columbian Museum, measures 4 feet 10 inches in diameter and is 15 to 20 inches in height. (See Plate 102.)

The occurrence of basketry water receptacles is a good problem in the study of the parallelism of subjective and objective forces which originated and developed special arts in primitive times everywhere. In this particular example, the originators of cement-tightened baskets had good textile material, knew the arts of weaving them, were on the move in desert countries where water sources were far apart, and

Plate 117. See page 251

PITCHER AND JUG FOR HOLDING AND TRANSPORTING WATER.
PAIUTE INDIANS, NEVADA

Collections of U. S. National Museum

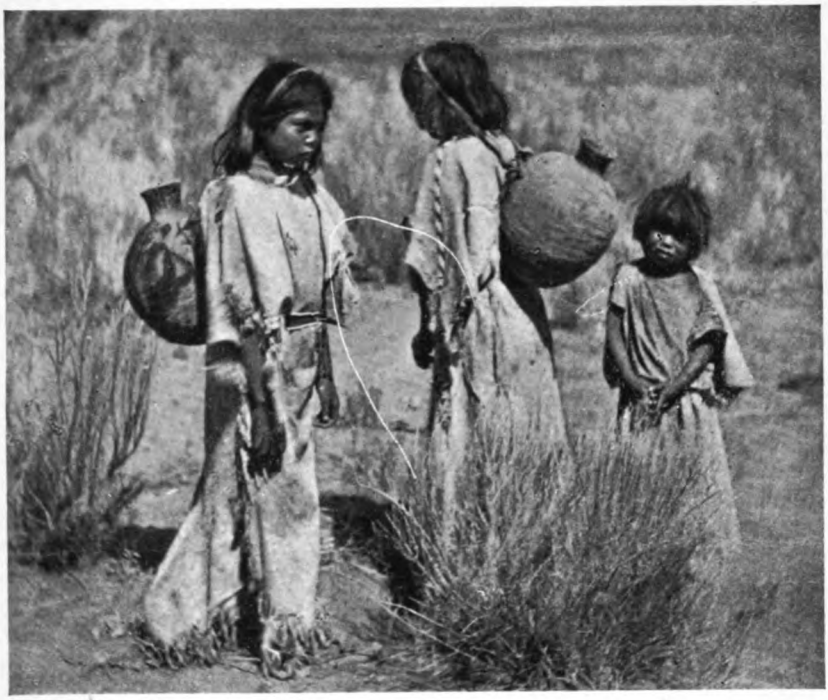


Plate 118. See page 251

PAIUTES, OF NEVADA, CARRYING WATER AND HARVESTING SEED

Photographs and Specimens collected by J. W. Powell

could easily secure the pine sap or the asphaltum for tightening purposes.

Plate 117 illustrates the water jug or pitcher of larger size, called O-oats by the Paiutes. Most of these are in coiled weaving, but even there a variety of technic is shown both in the foundation and in the sewing.

The upper figure is a pitcher-shaped water-carrier with globular body, used also for holding seed. The coiled foundation is of two or more rods, the stitches are wide apart, and overlap in what is called in Pomo, *tsai* work. The border is in oblique coiled sewing, and the handle is an afterthought set on the neck. Its height is 10 inches. This specimen, Cat. No. 11,249 in the National Museum, was collected in southern Utah by Major J. W. Powell.

The lower figure is a much neater specimen, in which the foundation is a single rod, and, in the sewing, the stitches simply interlock with those underneath, giving a very much more regular form to the surface. The border is in oblique coiled sewing. There are lugs on the side for the purpose of carrying, and the head-band is of soft deerskin. This specimen is Cat. No. 11,876 in the U.S.N.M., and also was collected in southern Utah by Major J. W. Powell.

The Powell collection contains a large number of these carrying jars in coiled work. They differ in the form of the body somewhat and in the length and shape of the neck, but in other respects, in structure and function, they are the same.

Plate 118 shows two Paiute girls carrying water in two water-tight jars of basketry, the straps, of soft buckskin, passing over the top of the head. Older persons of the same tribe are shown below, as gleaners, with the carrying bands across the shoulders and breast. The hats, of basketry, on their heads serve many purposes, being gathering baskets and mush bowls in addition to costume. The baskets in their hands are for fanning and roasting the chaff from the seed. (Plate 118.)

Alphabetical List of Uses

Armour made of slats and rods woven together.
Awning mats in front of cabins.
Bags for everything: for gathering, carrying, and storing, made in every quality.
Bait holding.
Ball-playing raquets.
Bases for pottery making (primitive wheel); also forms for portion of vessels.
Beds of matting in basketry.
Boiling baskets, for cooking flesh or mush.
Bread, mixing or serving.
Burden baskets in endless varieties.
Burial caskets and deposits.
Cages for insects, birds, etc.; also for children on Sioux travois.
Canoe covers, for cargoes (Swan).
Canteen, for personal water supply.
Cape, poncho, or other garment to cover the shoulders, both in animal and vegetable fiber.
Carrying basket, an immense class, with infinite variety of form and universal distribution.
Carrying chair, Guatemala and Peru.
Ceremonial objects; trays in rites and before altar, carried in dances, struggled for, etc.
Chef-d'œuvres, to show the best one could do.
Chest for treasures, regalia, and fine costume.
Children's toys; imitations of more serious objects.
Clothing; robes of twine, with or without feathers; hats, jewelry, capes, fringes, petticoats, leggings, moccasins, and receptacles for these.
Coffins of canes and reeds wattled together.
Cooking baskets, used with hot stones.
Cradles or papoose frames, quite widely distributed.
Creels, all varieties of fishermen's baskets.
Cremation baskets, burned at the woman's grave.
Cult baskets, Hupa basket wand (Ray), Hopi plaque (Fewkes).
Curtain mats for partitions.
Cushions in boat and kaiaks.
Dance baskets, used in ceremonies.
Ditty baskets for small articles of hunters.
Dress. (*See* Clothing.)
Drinking baskets or cups.
Drum, in Navaho ceremony.
Drying tray for fruit, seeds, etc.
Eagle traps and cages.
Etiquette baskets, for giving away on the proper occasion.
Fences of coarse basket technic; hunting fences.
Fine art in basketry.
Fish, holding, transporting, creels, bait baskets.

Fish trap, fish weirs, fykes, etc.
Food-serving baskets.
Foundations for pottery.
Fringes on garments, in refined basket technic.
Furniture in basketry.
Gambling baskets.
Gathering or harvesting.
Gift baskets.
Granary or storage.
Grasshopper baskets, so-called.
Hammocks in basket work.
Harvesting, fan or wand for beating seeds.
Hats for men or for women.
Head-rings, olla rings for carrying.
Hedges, employed chiefly in game drives.
Hoppers, for acorn and other mortars.
Houses, walls, roofs, floors, doors, and other parts.
Inclosures for the beginning of domestication.
Insect cage, for lighting and other purposes.
Jewel baskets, chef-d'œuvres of woman's art.
Jewelry, woven in finest material for ornament.
Leggings in twined weave.
Lined with clay for cooking.
Love baskets.
Marks on pottery.
Meal trays, useful and sacred.
Medicine, associated with sorcery.
Milling outfit, grinding, hoppers, brushes, sieves, etc.
Moccasins or sandals.
Money, mechanism of exchange.
Mortuary baskets of many kinds and functions.
Moulds for pottery.
Mud sandals, Klamath, for going in marshes.
Mush bowls for mixing or serving.
Musical instruments, rattles and drums.
Offerings of food to dead, and mortuary objects.
Paho, or prayer-stick wrappings (ancient graves).
Panniers, with saddles.
Papoose baskets.
Partitions for dwellings.
Patterns for pottery.
Picking baskets, for gathering nuts and fruits.
Pitcher basket, with wide mouth.
Plaques, for meal.
Plates or platters.
Ponchos. (*See* "Capes.")
Pottery. (*See* "Marks on Pottery"; also used to line roasting trays.) (Cushing.)
Prayer basket, Pahos.
Preparing food, mixing mush, bread, etc.
Quivers.
Raquets for ball-playing.
Receptacles of all sorts, for cooked food, dried fish, and all kinds of preserved meats and fruits. The basket-maker herself keeps her splints and stems in a basket.

Religion, used in services of.
Roasting trays, for parching seeds.
Robes of shredded bark.
Roof of basketry.
Sacred meal trays.
Saddlebags, of late application.
Sails, in both continents.
Seats, at home, in boats, etc.
Seed baskets, harvesting, carrying, and storage.
Seed beater, for harvesting.
Serving food, for single persons or a company.
Sieves, for screening or for shaking.
Skirts, both of common and ceremonial dress.
Sleeping mats.
Storage, fish, berries, pemmican, acorns. All tribes stored some kind of food.
Trade, medium of.
Treasure baskets, those considered treasures.
Trinket and feather storage, also herbs, gum, paint, etc.
Vizors of Katchina masks, made from segments of coiled basketry (Ute type), Hopi.
Washbowl, in ceremonies.
Water bottles, drinking cups, etc., of basketry dipped in pitch.
Water transportation, rafts of cane, mats for sails.
Wedding blanket or cover.
Winnowing baskets for seeds.
Zoötechny, or the arts associated with animal life.